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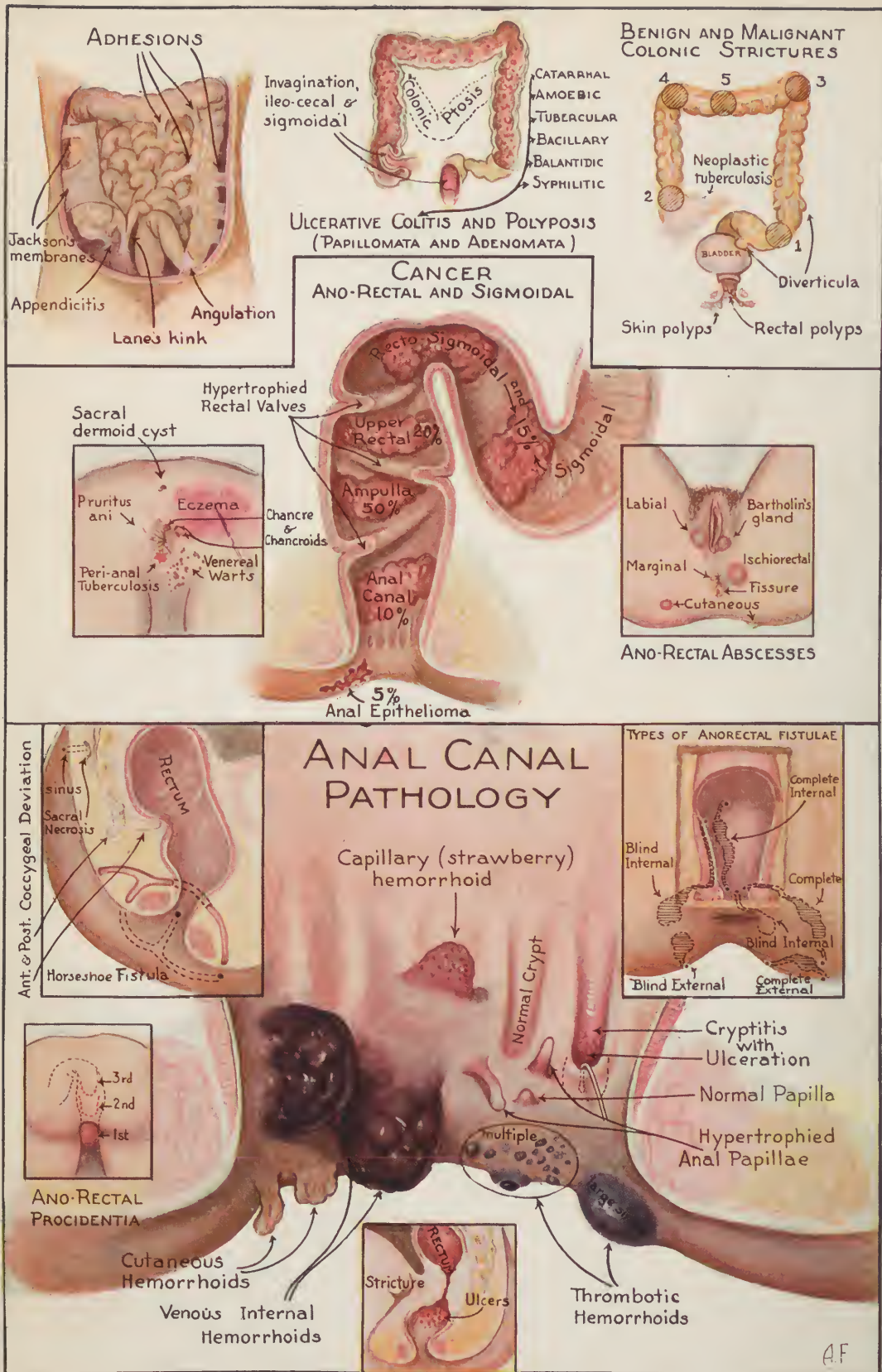












Author's topographic chart indicating the most frequent sites and appearances of colonic, sigmoidal, and ano-rectal diseases.



DISEASES  
*of the*  
RECTUM, ANUS, AND COLON

*Including the*

ILEOCOLIC ANGLE, APPENDIX, COLON,  
SIGMOID FLEXURE, RECTUM, ANUS,  
BUTTOCKS, AND SACROCOCCYGEAL REGION

BY

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NEW YORK CITY

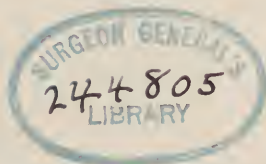
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WITH 1128 ILLUSTRATIONS ON 1085  
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VOLUME I - 3

PHILADELPHIA AND LONDON

W. B. SAUNDERS COMPANY



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no 2

THE AUTHOR TAKES PLEASURE IN DEDICATING THESE VOLUMES TO HIS PERSONAL  
FRIEND AND COLLEAGUE, DR. A. J. BARKER SAVAGE, TO WHOSE UN-  
TIRING EFFORTS, EXECUTIVE ABILITY, AND LOYALTY THE NEW  
YORK BROAD STREET HOSPITAL OWES ITS CONCEPTION AND REMARKABLY RAPID GROWTH.





## PREFACE

---

THE dominant idea of the author in the preparation of these volumes is to present to specialists, practitioners, and students a complete yet practical treatise covering the history, etiology, pathology, symptoms, diagnosis, treatment, and postoperative treatment of diseases involving the ileocolic angle, appendix, colon, sigmoid flexure, rectum, anus, and perianal region.

These volumes are not in any respect a revision of previous works by the author, the text being newly written from cover to cover, hundreds of new and original diagrams, photographs, microphotographs, radiographs, half-tones, color plates, and drawings having been incorporated.

Diseases of the ileocolic angle, appendix, colon, sigmoid flexure, rectum, anus, buttocks, and sacrococcygeal region have been rearranged, reclassified, and newly discussed to meet present-day conceptions of these affections. Many chapters have been included relating to diseases directly and indirectly involving the bowel not hitherto discussed in works of this character.

To eliminate useless material and make the books convenient in size and easily comprehensible discussion of subject matter has been as brief as clarity would permit.

Repetition of overlapping subjects has been avoided by cross references, and worthless new methods have not been discussed for the sake of novelty.

For brevity's sake the names of many authorities, whose dicta are incorporated in the text, have been omitted.

In this connection I desire to express my sincere thanks to Dr. E. A. Rundquist for valuable assistance rendered during preparation of the manuscript; to Mr. Howard J. Shannon, Mr. K. K. Bosse, and Mr. Alfred Feinberg, medical artists, to whose artistic skill I am indebted for most of the excellent drawings and color plates illustrating the text; to Mr. Joseph Garber, of the Lexington Hospital, for photographs and radiographs; to my secretary, Miss Catherine Gillen, for preparing statistical tables and typing the manuscript, and finally, to my publishers, the W. B. Saunders Company, for the many courtesies extended to me before and while the work was passing through the press and to whom credit for the mechanical attractiveness of the books is due.

If these volumes are favorably received, as were my works on "Constipation, Obstipation, and Intestinal Stasis" and "Diarrheal, Inflammatory, Obstructive, and Parasitic Diseases of the Gastro-intestinal Tract," and serve to stimulate added interest in this class of affections, the importance of which is not fully understood, the author will feel highly complimented and amply repaid for the years of interesting work and financial outlay expended in their preparation.

SAMUEL G. GANT.

471 PARK AVENUE,  
NEW YORK CITY.  
*January, 1923.*

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# DISEASES OF THE ANUS, RECTUM, AND COLON

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## Chapter I

### Embryology of the Stomach, Small Intestine, Colon, and Rectum

FOR the average physician embryology is uninteresting and confusing, and because of this the author will not go further into the subject than to trace the embryonic changes of the alimentary canal following the time when the gut tract first becomes discernible as a simple, even straight, tube, that the reader may understand the steps of its development and the manner in which congenital deformities of the bowel are formed.

At this time there is both a larger *outer* and smaller *inner* embryonic cavity, the former being known as the *yolk sac*—*umbilical vesicle*, and the latter as the *gut tract*, and the tube-like connecting link between them is called the *vitelline duct*. At first the gut tract or tube has no external communication, and extends from one end of the embryonic body to the other, but is connected with the spinal cord by the *neurenteric canal*.

It is well to bear in mind that the gut tract represents the alimentary canal and not the intestine solely, as its name would indicate, and is divided into three parts, an upper or *fore gut*, lying above the opening of the vitelline duct, from which is formed a part of the mouth, tongue, pharynx, esophagus, stomach, major portion of the duodenum and appendages, the liver, and pancreas; the *hind gut* (Fig. 1) or tail end, which later enlarges to form a portion of the colon and rectum; and the *mid gut*, which represents the intervening portion opening freely into the *yolk sac*.

As the gut tract develops (about the fourth week) it first enlarges at the *pharynx*, then narrows at the *esophagus*, again dilates at the *stomach*, and finally, beyond this point, once more becomes narrow to form the intestinal tract, the lower end of which bulges into the rudimentary rectum. In ratio, as these various regions assume their more fully developed proportions, the umbilical vesicle diminishes in size until small, when it is designated the

*vitello—intestinal duct—yolk stalk*, and is attached to the bowel near the stomach.

In 3 per cent. of cases the yolk stalk or vitelline duct is not obliterated during fetal life and remains as a blind sac, known as *Meckel's diverticulum*. Under such circumstances it may cause serious trouble when it becomes invaginated into the small intestine or angulates it through pressure. Again, Meckel's diverticulum may induce considerable annoyance and discomfort when it remains attached to the umbilicus, or in the form of a tube—fecal fistula—connects it with the intestine, or acts as a medium through which the bowel may extrude and cause congenital umbilical hernia.

The **stomach** dilates more rapidly posteriorly and forms the *greater curvature*, attached to the mesentery—mesogastrium—than it does ventrally; this accounts for the *lesser curvature* which is attached to the ventral body by the mesogastrium. Later the

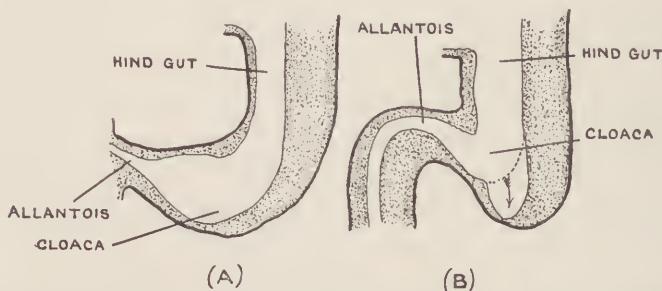


Fig. 1.—Formation of cloaca from the hind gut during third week: *A*, Section of posterior end of human embryo early in the third week; *B*, later in the third week when the hind fold is more developed and the cloaca assumes its triangular form. (Jones.)

stomach rotates until it reaches almost a horizontal position, when its upper—left—becomes the *cardiac*, and the lower—right—the *pyloric* end, and as rotation takes place the left vagus nerve is carried to the left and ventrically, while the right traverses the posterior wall of the stomach.

The **intestine**, when first recognizable—about the *fourth week*—as an entity, appears as a tube extending between the stomach and blind end—caudal—of the embryo, maintains the same diameter throughout, and possesses a double mesentery, *ventral* and *dorsal*, which blend with the mesogastrium and suspend the bowel in the body cavity. During the *fifth* and *sixth* weeks marked changes take place in the gut tract owing to the rapid growth of the intestine and its formation into loops. The principal loop is U shaped (Fig. 2) and projects downward toward the ventral body wall as its dorsal mesentery elongates and the vitelline duct connects its anterior



surface with the umbilicus. Shortly the lower extremity of the U loop enlarges to form the *cecum*, the distinguishing point between

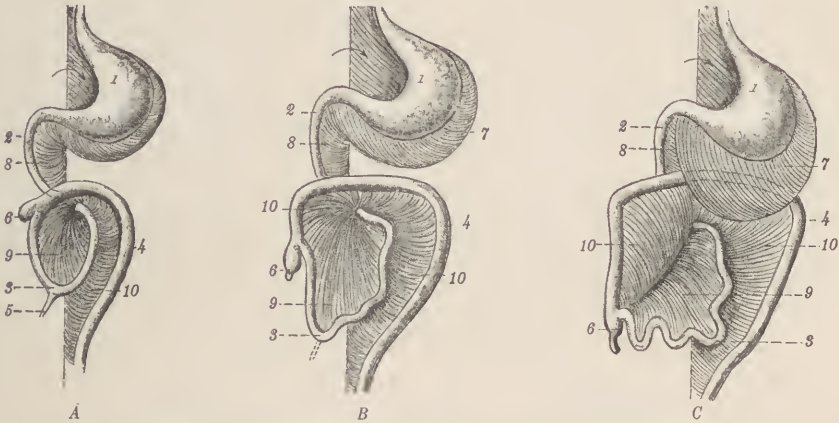


Fig. 2.—Three successive stages showing development of the digestive tube and mesenteries in the human fetus (modified from Tourneux): 1, Stomach; 2, duodenum; 3, small intestine; 4, colon; 5, vitelline duct; 6, cecum; 7, great omentum; 8, mesoduodenum; 9, mesentery; 10, mesocolon. The arrow points to the orifice of the omental bursa. The ventral mesentery is not shown. (Heisler.)

the *proximal* or small intestine and the *distal* or colon, which at present is composed of the *transverse* and *descending* colons and

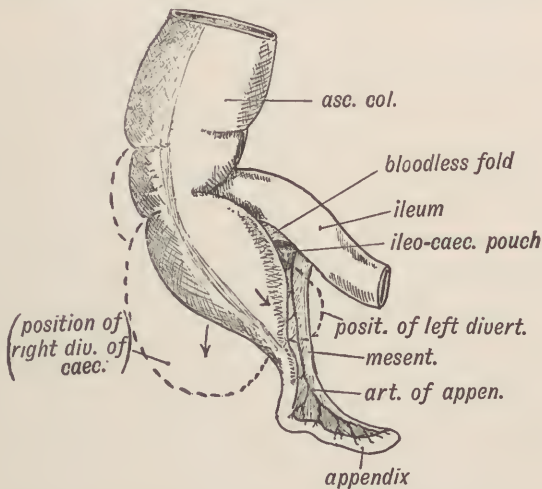


Fig. 3.—Diagram of apex of the cecum at time of birth and diverticula which may be produced in the fundus of the cecum. (Keith, "Human Embryology and Morphology.")

*rectum*, since the *ascending* segment (colon) does not develop until the cecum has grown sufficiently long to permit it to extend down-

ward and into the right iliac fossa, which occurs about the seventh month. At about the *sixth week* a part or all of the *large* intestine is slowly extruded through the abdominal wall, where it remains until the *tenth* or *twelfth* week, when it re-enters the abdomen, but during this time and thereafter segments of the colon increase in diameter with greater rapidity than the small bowel, and rapidly develop and assume more nearly their permanent appearance.

The *small* intestine shows *curvings* by the *fifth* week, and within a *fortnight* thereafter the *duodenum*, first segment, which extends from the pyloric end of the stomach to the posterior body wall, becomes well marked, and then, as the small bowel rapidly elongates, a considerable portion of it passes to the outer side of the abdominal

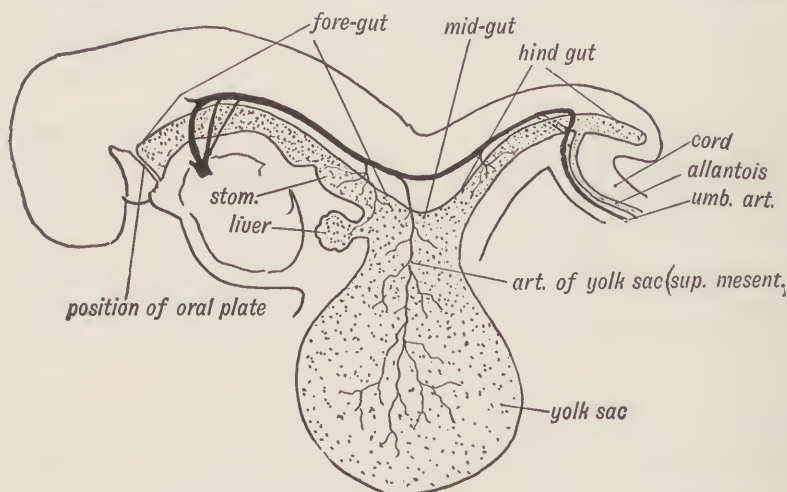


Fig. 4.—Form of alimentary canal during fifth week. (Keith, "Human Embryology and Morphology.")

wall into the umbilical cord, where it remains from four to five weeks, and then again passes into the abdominal cavity. Now there are discernible *six* loops of the small gut which occupy the following positions: the *first*, or duodenal, as above described; the *second* and *third*, the left upper portion of the abdominal cavity; the *fourth* is similarly located on the right side; the *fifth* occupies the left iliac fossa, and the *sixth*, the pelvis and central portion of the lower abdomen.

Naturally, as the stomach and intestine become larger and longer, their restraining membrane, the *mesoblast*, which carries their vascular supply, lengthens and forms the common *mesentery*, which, according to the viscera with which it is connected, is designated respectively the *mesogastrium*, *mesocolon*, and *mesosigmoid*.

In the beginning the entire intestine possesses a mesentery which is augmented as the parts grow; later on that of the duodenum becomes practically obliterated, as does also that of the cecum, ascending and descending colons, owing to the fact that these segments of gut push through and displace the mesenteric layers in the course of their expansion. Originally the small and large intestine have a common mesentery, and in case the colon fails to properly develop or the cecum to descend, they are left with an abnormally lengthy mesentery which may permit them to rotate upon themselves (cecum mobile, etc.) and produce volvulus. At first the transverse colon is unconnected with the common mesentery of the stomach and lies horizontally to and behind it, but joins it about the *fourth month*, when this segment of the colon is connected with the dorsal surface of the *greater omentum*.

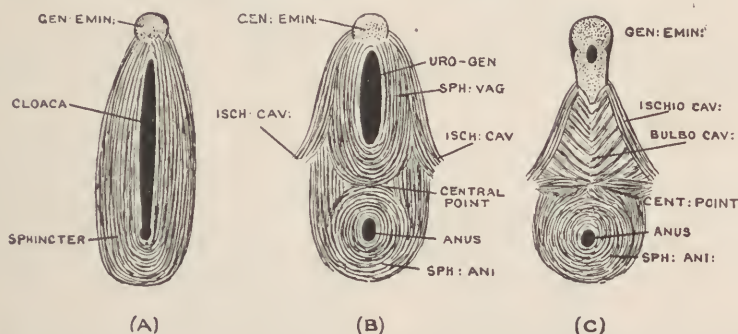


Fig. 5.—Stages in evolution of the perineal musculature (Popowsky): *A*, Sphincter of cloaca in second month; *B*, its division at beginning of the third month; *C*, its condition in male fetus at end of the third month. (Keith.)

As the stomach rotates and the liver enlarges the ventral mesogastrium becomes a transverse fold, and the portion which attaches the latter to the abdominal wall is transformed into the falciform and coronary ligaments, while that part which originally joins the anterior surface of the stomach—later lesser curvature—with the liver becomes the *lesser omentum* and bounds the ventral opening of the *omental bursa*.

**The Anus** (Fig. 5).—It has already been mentioned that the primitive gut of the embryo ends blindly at its caudal extremity; consequently, the anal orifice forms secondarily a process of development interesting to follow. The *entoderm*—hypoblast—approaches and finally blends with the *ectoderm*—epiblast—to form the *anal membrane*, about the *third week*, following thinning and their displacement of the *mesoderm*—mesoblast. This membrane, which is located a short distance above the blind end of the primitive gut,

becomes depressed and forms the *anal pit* or *proctodeum* about the end of the *fifth week*, while that portion of the tube caudal to it, designated as the *postanal gut* (vertebrates), is gradually obliterated.

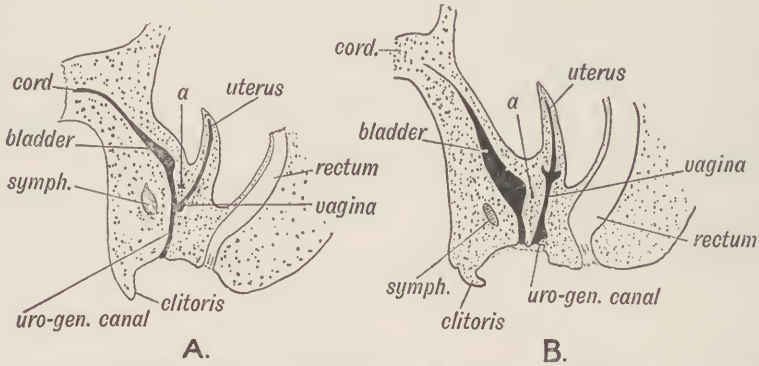


Fig. 6.—Section showing urogenital sinus: *A*, In third month female human fetus; *B*, in fifth month female human fetus; *a*, vesicovaginal septum. (Keith, "Human Embryology and Morphology.")

About this time the *allantois* becomes noticeable upon the anterior surface of the gut as a *diverticulum*, from which are formed the *bladder* and *urogenital sinus* (Fig. 6) which connects the former with the intestine just above the anal membrane. A little below

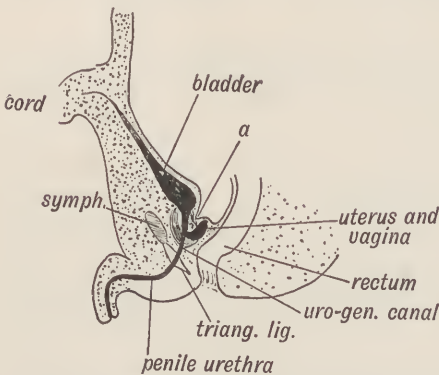


Fig. 7.—Section showing urogenital sinus in male fetus: *a* indicates part corresponding to the vesicovaginal septum of the female. It is occupied by the third lobe of the prostate. (Keith, "Human Embryology and Morphology.")

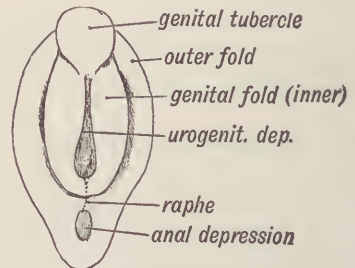


Fig. 8.—Diagram showing terms applied to external genital parts of the embryo. The outer genital fold represents the cloacal fold; the inner genital folds, the anterior parts of the perineal folds; the urogenital depression or cleft, the primary meatus. (Keith, "Human Embryology and Morphology.")

the openings of the urogenital ducts the gut dilates to form the *cloaca*, in which both the intestinal and urinary systems end. About the end of the *second month*, through the formation of the urorectal



fold or partition, the cloaca is divided into the *rectum* and *anal canal* dorsally and the *urogenital sinus* (Fig. 6) ventrally, after which the septum grows and extends toward the surface to form the *perineal body* or *perineum* (Fig. 7). During the *third month* or later the pit of the anal membrane deepens markedly, and finally, about the beginning

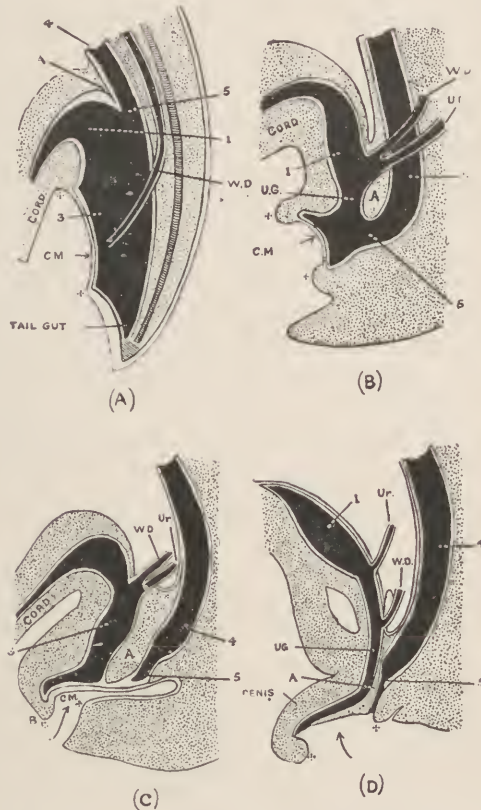


Fig. 9.—Showing manner in which the rectum becomes separated from the urogenital sinus (entodermal cloaca) during development of the human embryo: *A*, From human embryo, 4 mm. long (about twenty days). *B*, From human embryo, 11 mm. long (about thirty-five days) (after Keibel). *C* and *D*, Later stages of development: 1, Bladder; 2, wolffian duct (ureter and vas); 3, entodermal cloaca; 4, rectum; 5, anus; *C.M.*, cloacal membrane; *U.G.*, urogenital sinus; *A*, mesoblast at junction of rectum and entodermal cloaca; *B*, penis; *XX*, limits of perineal depression (ectodermal cloaca). (Keith, "Human Embryology and Morphology.")

of the *fourth month*, it ruptures at the point where the mucous membrane and skin blend—pecten of Stroud or Hilton's white line—and effects a complete union between the *rectum* and *anus*. Occasionally the anal membrane or plate is not obliterated, but remains and causes an *imperforate anus* which requires surgical

attention after birth, while the caudal extremity of the gut below the anus normally disappears.

The pouch connected with the neurenteric canal already referred to, located at the posterior and caudal extremity of the primitive gut, becomes partially obliterated to form the *coccygeal*—Luschka's—gland, which is permanent and situated upon the anterior surface of the coccyx. When this culdesac does not become obliterated during fetal life, later on it is the starting-point from which most sacrococcygeal cysts and tumors develop.

**Developmental Histology of the Gastro-intestinal Tract.**—The primitive alimentary canal from the esophagus to the anus has two layers, the *entoderm*, and the splanchnic or visceral, the *mesoderm*.

“In an initial step in the process the *cells of the mesodermic stratum* undergo multiplication and arrange themselves in a narrow loose *inner zone* and a thick *outer lamella*. The inner layer subsequently becomes the *submucosa* of the fully formed state, while the cells of the outer layer undergo differentiation into unstriped muscular tissue and constitute the *muscular coat* of the canal. In the case of the esophagus and stomach, at least, this muscular tunic in the fourth month exhibits the distinction between inner circular and outer longitudinal layers. The *surface cells* of the mesodermic stratum of the primitive stomach and bowel become the *endothelium* of the serous coat.

“The *glands* of the entire canal are products of the inner, entodermic stratum, and therefore they are immediately related genetically as well as histologically with the mucous membrane.

“The *glands of the stomach*, both the *peptic* and the *pyloric*, originate from small cylindric cell masses that have been produced by local multiplication and aggregation of entodermal cells. By the hollowing out of the cylinders and the branching of the tubes thereby formed the two varieties of gastric glands are evolved. Both sets make their appearance in the tenth week. Until the fourth month the peptic glands contain cells of but one type; at this period, however, certain cells of these glands become altered by the gradual accumulation of granules within their protoplasm by which they are transformed into the characteristic *acid* or *parietal cells* of these glands.

“The *glands and villi of the intestine* are likewise products of the entodermal lining of the gut. Their evolution begins in the second month and they are fairly well formed by the tenth week. As in the case of the gastric glands, the glands of the bowel develop from cylindric masses of entodermal cells which are at first solid, but which later become hollowed out to form tubular depressions or

follicles. In the region corresponding to the upper part of the small intestine many of these follicles branch to give rise to the *glands of Brunner*, while unbranched, simple, tubular depressions distributed throughout the entire length of the bowel become the *glands of Lieberkühn*. While the surface entoderm is thus growing into the underlying mesodermic tissue to form the glands, it becomes elevated into minute projections between the mouths of the gland ducts, forming the *villi* of the intestinal mucosa. The connective-tissue core of the villus is derived from the underlying mesodermic tissue, the cells of which, proliferating, grow forth into the entoderm. The villi at first are present throughout the large and the small intestine alike, being well developed by the fourth month; while the villi of the small bowel continue their development, those of the large intestine, after the fourth month, begin to retrograde. At the time of birth they are still discernible, but at the end of the first month after birth they are completely obliterated" (Heisler).

**Congenital and Acquired Abnormalities and Displacements of the Intestine.**—*General Remarks.*—Any and all parts of the intestinal tract, like other organs of the body, are at times displaced or deformed through congenital defects, lack of development after birth, or pathologic changes. It is not the intention of the writer to deal at length with the etiology, pathology, and treatment of these conditions here because they have received due attention elsewhere, but he desires to point out in a general way some of the more common deviations from the normal arrangement that may be encountered in the different segments of the intestine—particularly displacements.

With the exception of the *duodenum* the remainder of the small intestine is abnormal or displaced less often than is the *colon*, *sigmoid flexure*, and *rectum*, though occasionally it may be pushed to one side through distention of other viscera and tumors, or become twisted or angulated through pressure or pulling upon it by adhesions.

The *duodenum*, however, is frequently found deformed and out of position largely through its gastric connection, because the stomach when distended, diseased, or ptotic may drag and angulate it in either direction; less often it is disturbed by displacements of the transverse colon and pancreas.

The entire *colon* may be absent or transposed, and its various parts may be congenitally displaced, shortened, elongated, dilated, or constricted, abnormalities which often annoy the patient and confuse the surgeon during operation.

The *cecum* has been encountered very large and small, absent



where the ascending colon terminated in a blind end beneath the liver, angulated upon itself, and has been found in practically all parts of the abdomen, especially the pelvis, where it and the appendix have been frequently observed free or attached to neighboring structures.

The *transverse colon*, owing to its great length, horizontal position, lengthy mesentery, relation to the diaphragm (during respiration) and stomach (when distended or displaced), and manner in which it is affected by tight lacing has been encountered (congenitally or acquired), ptotic—M, U, or V shaped—displaced, twisted, or angulated more frequently than the ascending, descending, or sigmoid colons. The author has operated twice for congenital dilatation of the colon—Hirschsprung's disease—complicated by complete collapse of the transverse colon, which was found resting upon the pelvic organs and packed with hardened feces, and has also operated for the relief of partial obstruction where the central portion of this segment of bowel was ptotic and firmly anchored to the cecum in one instance, and to the uterus, left ovary, and sigmoid flexure in another, and the gut in the latter case was sharply angulated and twisted by strong, contracted, bandular adhesions.

The *descending* and *sigmoid colons* are continuous and congenital, and pathologic abnormalities of one are prone to involve the other, but of the two, the sigmoid colon is most often displaced, too short, abnormally long, congenitally displaced, or drawn out of position or shape by adhesions, pelvic disease, or a deficient mesentery. Variations in the length of the sigmoid flexure are discussed in the next chapter, and it is not necessary for the author to do more here than to state that he has observed it to be more than double its normal length located in all parts of the abdomen, and in some instances so short that it was impossible to bring it into the wound for purposes of sigmoidopexy, excision, or colostomy. In one very interesting case observed by him there was a double transposition of the colon below the flexures, that is, the descending and sigmoid segments were found to the right and the cecum and lower ascending to the left of the pelvis, and at the point of crossing just below the umbilicus the two pieces of bowel were cemented together by congenital adhesions.

On account of the unusually long mesosigmoid of infants and young children displacement of the sigmoid flexure and descending colon to the right inguinal region is very common, and if while there the gut becomes inflamed or ulcerated from colitis, peritonitis, etc., permanent adhesions may form and cement the abnormally

placed intestine to adjacent structures, which is followed later by persistent pain and obstipation. The author some time ago operated for Dr. Charles G. Kerley upon a little boy three years of age, who from birth had suffered from obstipation, colonic dilatation, and recurring fecal impaction, which was proved by operation to have been caused by chronic invagination of the sigmoid flexure into the rectum and displacement of the hepatic flexure, which was sharply angulated and firmly bound to the inner abdominal wall at the navel by a thick fibrous band (Fig. 689). The operation, which was successful, consisted in reducing the invagination, dissecting the flexure free, and suturing both displaced segments of gut to the abdominal wall near their normal positions. In two other patients recently operated on for mechanical constipation the cecum, sigmoid flexure, transverse colon, and stomach were found massed together in the pelvic region, free in one and glued together in the other instance. Since in both cases the kidneys and liver were also far below their normal limitations and there was a history of obstinate constipation dating back to early childhood, it is probable that the deformities were congenital and that splanchnoptosis had existed from birth or shortly after.

## Chapter II

### Anatomy of the Rectum and Anus

#### RECTUM

THIS segment of gut, which is straight, tubular, and about  $5\frac{1}{2}$  inches (13.9 cm.) in length, longer in men than women, extends from the middle of the third sacral vertebra to the anus, and narrowest at the rectosigmoidal juncture and anus, lies in the median line following the anteroposterior sacrococcygeal curve for about 3 inches (7.62 cm.) to the tip of the coccyx, from whence it passes downward and backward for approximately  $1\frac{1}{2}$  inches (3.8 cm.) to the anus.

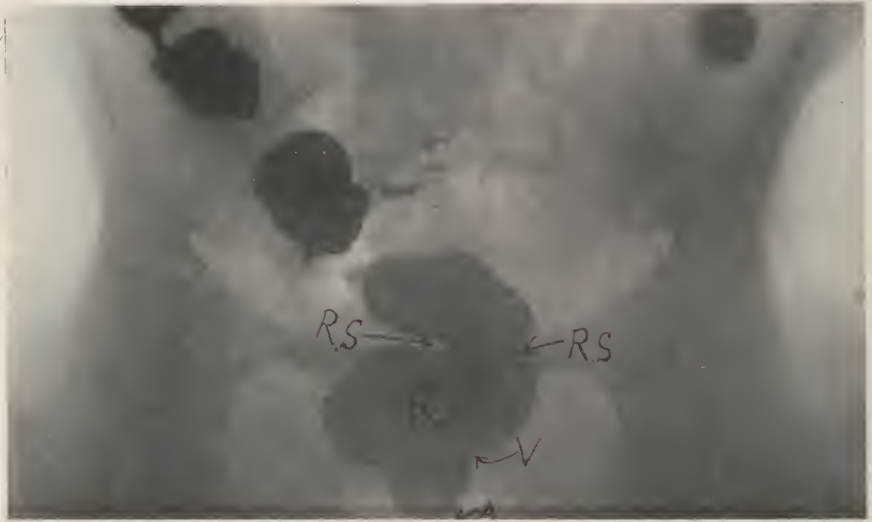


Fig. 10.—Radiograph of normal rectum: *R*, Rectum; *R.S.*, rectosigmoidal juncture; *V*, indentation made by rectal valve; *A*, anal canal. Radiographed at Broad Street Hospital.

The lower 3 inches (7.62 cm.) of the sigmoid, possessing a peritoneal covering and mesocolon, was formerly described as the upper third of the rectum.

The rectum (Fig. 12), which is movable and variable in size when empty and distended, has for purposes of description been divided into the *upper* and *lower* rectum, the former being designated as the *ampulla* or *middle*, and the *lower* as the *anal canal* or *fixed* rectum.

**Movable Rectum (Ampulla).**—This spacious sacculated portion of the rectum (Fig. 12), known as the *ampulla*, which lies between the upper—left—rectal valve at the lower margin of the recto-sigmoidal juncture and funnel shape beginning of the anal canal, is inflatable, capable of lateral and vertical motion, and its anterior and posterior walls remain in apposition, forming a *transverse slit* in the empty state, but are widely separated when the bowel is distended artificially or with gas and feces. When viewed through the proctoscope, owing to arrangement of Houston's valves (Figs. 11, 17), the upper rectum is seemingly divided into three *compartments*, and the outer surface of the bowel is marked by depressions at three

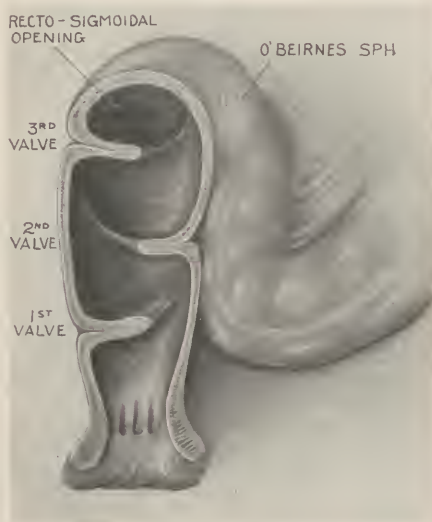


Fig. 11.—Rectum opened, showing the rectosigmoidal opening and location of rectal valves. To the right is indicated circular fibers that form O'Beirne's sphincter.

points (Fig. 11) due to infolding of the rectal tunics constituting the rectal valves. Shape of the ampulla varies in different individuals, and it is greatly distorted when strictured, occluded by a tumor, and ballooned as the result of atonic constipation. Lateral and vertical mobility is demonstrated by inserting finger or proctoscope and having the patient strain down or draw the bowel upward, when it will be observed that rectal valves and lesions within the ampulla change from a higher to a lower level, or vice versa. Inflation of the upper rectum is easily accomplished through the proctoscope with patient in the knee-chest or inverted posture, but is difficult or impossible when the rectum is thickened by chronic inflammation or distorted by scar tissue.



Lesions in the *movable* are less sensitive than those further down, and the ampulla surgically is of less importance than the *fixed* rectum, where 80 per cent. of anorectal affections are encountered, but diseases of the upper rectum, such as procidentia recti, new growth, strictures, etc., require more serious operations than affections located near the anus.

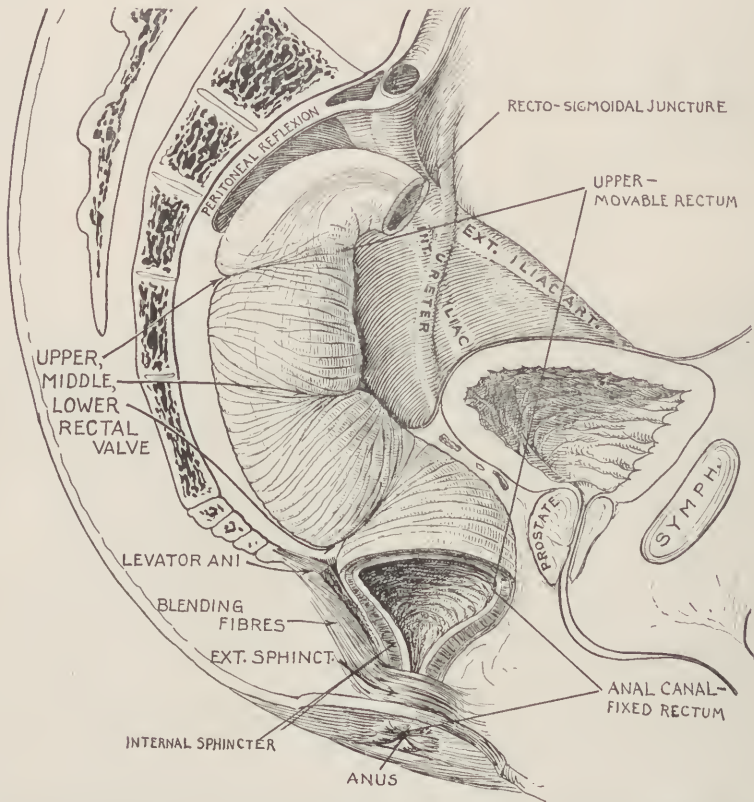


Fig. 12.—External topography and relation of the rectum to the sacrum, peritoneum, iliac vessels, ureter, and prostate.

**Fixed Rectum (Anal Canal).**—The anal canal or fixed rectum (Fig. 12), situated between intersection of the levator ani and bowel and the mucocutaneous juncture—Hilton's white line—is tube-like, funnel shaped at the upper extremity, surrounded by the external and internal sphincter muscles, is  $1\frac{1}{2}$  inches (3.8 cm.) in length during repose. The lateral walls are in contact, forming an *anteroposterior slit* opposite to that of the upper rectum, and this tube-like termination of the rectum, which is narrow, rigid, and

difficult or impossible to inflate, may be drawn upward through contractions of the levator ani muscle stimulated voluntarily or by sensitive anal lesions.

Feces collect in the movable but are not found in the fixed rectum except momentarily during defecation. The more common (80 per cent.) of anorectal diseases—hemorrhoids, fissures, ulcers, fistulæ, hypertrophied papillæ, inflamed crypts, and diminutive polyps—are met with in the anal canal, which renders them accessible for operation under local anesthesia, while more serious affections—cancer, strictures, and procidentia recti—demanding general narcosis are usually encountered in the upper or movable rectum.



Fig. 13.—Paraffin-injected rectum and sigmoid flexure from child three years old showing angulated rectosigmoidal juncture, curves, mesentery, bladder, and rectovesical fold of peritoneum.

Lesions in proximity to the anus are more painful than those of the upper rectum owing to abundant nerve distribution and surrounding muscles that undergo spasmodic or tonic contraction when irritated.

**Structure.**—The rectum is composed of four coats, viz.: *serous*, *muscular*, *submucous*, and *mucous*.

**Serous (Peritoneal) Coat.**—The rectum is devoid of a peritoneal covering except at the rectosigmoidal juncture and small areas on its anterior and lateral surfaces and peritoneal reflections that anchor the bowel to the bladder, rectovesical pouch, uterus, Douglas' culdesac, and sacrum.

The distance from the anus to the peritoneal attachment is variable, but average  $2\frac{1}{2}$  inches (6.35 cm.) in females and  $3\frac{1}{2}$  inches (8.89 cm.) in males, with an additional inch (2.54 cm.) when the bladder and rectum are distended, but the peritoneum may be encountered lower down in the aged, infants, and patients suffering from procidentia recti or uteri, recurring fecal impaction, stricture, invagination, or new growths complicated by straining.

Many deaths from perforation or rupture and peritonitis have followed introduction of the hand, sigmoidoscope, or bougie and inflating instruments where the rectum was ulcerated, strictured, or malignant at or above the peritoneal reflection, and other fatalities have resulted from operations performed to relieve upper rectal

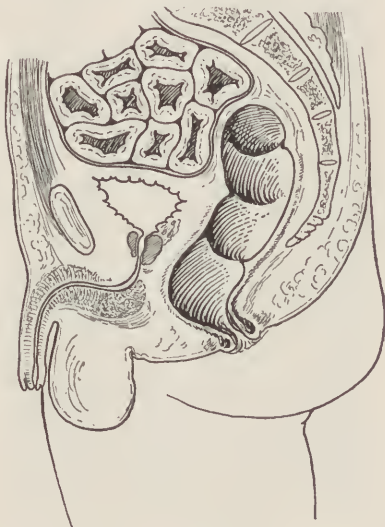


Fig. 14.—Topography of the rectum.

affections. Knowing the height of the peritoneal reflection and location of growths one can in advance determine whether or not opening of the peritoneal cavity is necessary in rectal extirpation for cancer or stricture.

*Muscular Coat.*—The muscular or thickest rectal tunic is composed of *circular* and *longitudinal* muscle-fibers, the latter being derived from spreading out of the sigmoidal longitudinal bands which almost disappear in the lower rectum.

*Circular* muscle-fibers vary in number, direction, and thickness at different points, being few and thin in the upper two-thirds and stronger and more numerous as they approach the anus, where they accumulate to form the *internal sphincter muscle* (Fig. 12) about



1 inch (2.54 cm.) in width, which is separated from the anal muscle (Fig. 12) by a groove. These fibers branch out fan-like at the center of the ampulla and rectal valve indentations (Fig. 12), but elsewhere pursue an irregular, sometimes figure-of-8 course except about the lower anal canal, which they surround in circular fashion.

*Submucous Coat.*—This tunic, which is thicker here than elsewhere and formed of dense connective tissue in which blood-vessels, nerves, and lymphatics ramify, is sufficiently relaxed to permit the mucosa to glide over it. In chronic inflammatory affections it becomes thickened, rigid, and adherent to the mucous and muscular tunics, interfering with their mobility.

The submucosa frequently is the site of burrowing ulcers and fistulæ in aggravated cases of amebic, bacillary, syphilitic, and tubercular coloproctitis.

*Mucous Coat.*—The rectal mucosa is thick, very vascular, dark red in color, glides easily over underlying structures, and presents an irregular surface due to transverse mucous folds, Houston's valves, columns of Morgagni, semilunar valves, crypts, and anal papillæ, permanent structures except the first named, which disappear upon distention. Mucosa is composed of an epithelial and glandular layer together with the muscularis mucosæ.

Epithelium of the *upper* is of the *columnar* type, but in the *lower* rectum it becomes *stratified—transitional*—in vicinity of Hilton's white line, where skin and mucosa blend. Beneath the epithelium are occasional lymphoid *nodules—solitary glands*—having interspaces tightly packed with follicles. *Lieberkühn's glands*, which are vertical, thin walled, lined with columnar epithelium, and arranged side by side, are scattered through the terminal bowel, and the *tubular, mucus-secreting goblet cells* which are multitudinous give to the mucosa a *honeycombed* appearance when viewed through a lens, provide a suitable broad surface for absorption which is easily demonstrated by introducing certain drugs and enemata into the rectum and colon.

*Racemose, sebaceous, and sudoriferous glands* are found in the mucosa and skin about the anus, and secretions from the last two are mainly responsible for the unpleasant odor emanating from the anal region. Diminutive abscesses and fistulæ are occasionally caused by collections of sebaceous matter that become infected.

**Columns of Morgagni, Anal Papillæ, and Semilunar Valves (Crypts).**—In the mucosa of the anal canal, beginning just above the mucocutaneous juncture—Hilton's white line—and extending upward for  $\frac{1}{2}$  inch (12.7 mm.) are several—five to ten—longitudinal *plicæ* caused by sphincteric contraction known as the *columns of*

*Morgagni* (Fig. 15) which are broader above than below, contain muscular fibers, and are difficult to efface. Suspended between the lower extremities of Morgagni's columns are transverse, cup-shaped folds of mucosa from  $\frac{1}{12}$  to  $\frac{1}{6}$  inch (2.1–4.2 mm.) in depth, known as the *semilunar valves*—crypts, sacculi, Horner's pockets (Fig. 15)—the function of which is to collect mucus for lubrication of the feces during defecation.

Located at the distal end of Morgagni's columns are several—ten to fourteen—minute elevations or anal *papillæ* (Figs. 15, 16) composed chiefly of stratified epithelium and slight amount of connective tissue, containing an arteriole and a nerve filament. They

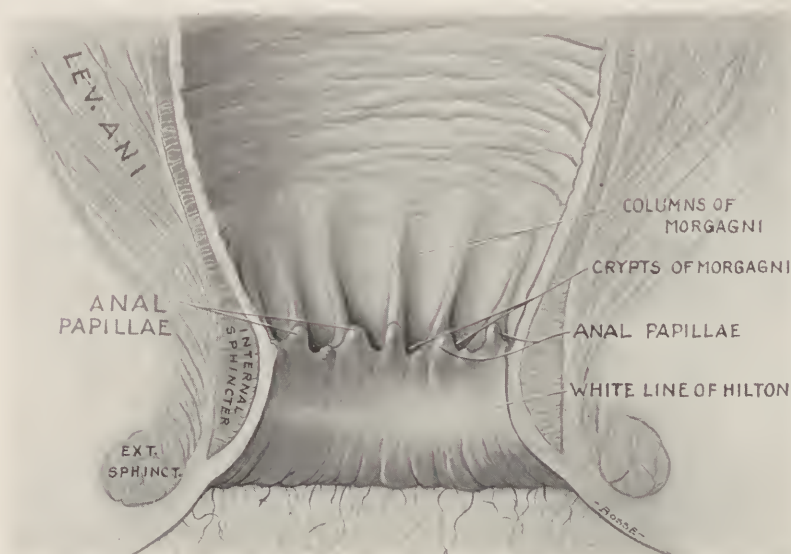


Fig. 15.—Anatomy of the anal canal, columns of Morgagni, crypts of Morgagni, anal papillæ, white line of Hilton, and relation of the sphincters and levator ani to the lower rectum.

are important organs connected with a special rectal sense not invariably present, and one may be unable to demonstrate them unless they are hypertrophied (Fig. 16).

Self-styled "official surgeons" have written *in extenso* emphasizing the pathologic importance of the "pockets"—crypts—and "papillæ," and would lead one to believe they are fruitful sources of suffering when such is not the case.

Occasionally semilunar valves (Fig. 15) are abnormally developed, ulcerated, or torn, forming a fissure, or serve as an outlet for fistula or receptacle for seeds and fecoliths that induce local and reflected pain.

Papillæ are seldom diseased primarily, but occasionally enlarge and project into the anal canal, where the mucosa is con-



Fig. 16.—Hypertrophied anal papillæ that incite sphincteralgia and cause constipation.

stantly bathed with an irritating discharge from an inflamed or ulcerated rectum. When hypertrophied they appear as pyramidal

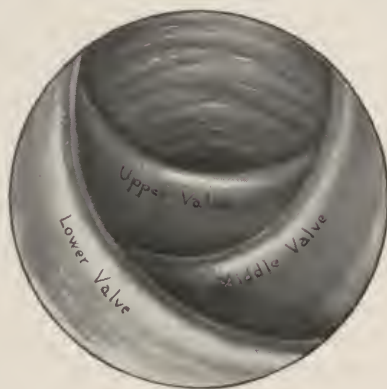


Fig. 17.—Typical appearance of rectal (Houston's) valves as seen through the proctoscope following inflation of the rectum: *A* indicates the rectosigmoidal opening.

eminences varying from  $\frac{1}{16}$  to  $\frac{1}{2}$  inch (1.5–12.7 mm.) in length, having a *grayish apex* (Fig. 16), owing to absence of blood-vessels,

and base that is more highly colored than surrounding mucous membrane.

**Rectal (Houston's) Valves.**—In the rectum above the anal canal are several permanent anatomic folds—shelves—that instead of being effaced are made more prominent by distention. These structures, known as *rectal* or *Houston's valves*, are demonstrable in the living and dead, infant, child, or adult, except when destroyed



Fig. 18.—Microphotograph showing how the rectum projects inward, forming rectal valves and mucous, submucous, and muscular coats composing the valves.

by disease or pathologic changes in the rectum, making inflation impossible. The valves are obliquely placed, cup shaped, with concavities directed upward, extend from one-half to two-thirds around the bowel, project into the rectum from  $\frac{3}{4}$  inch to  $1\frac{1}{4}$  inches (19 mm–3.18 cm.), are capable of vertical motion, and are plainly visible through the proctoscope following rectal inflation.

Houston's valves may vary in number, thickness, and size, but usually there are *three*, placed as follows: The *upper* valve is on



the *left* immediately below the rectosigmoidal opening, the *middle*, most prominent, is situated on the *right* anterior wall 3 inches (7.62 cm.) above the anus, and the *lower* valve is located on the *left* rectal wall a short distance above the beginning of the anal canal (Fig. 17). These crescent-shaped folds are occasionally placed one above the other, extend nearly around the bowel stricture-like, or block the rectum when in the form of a diaphragm. Normally they are sort of a *spiral stairway* that rotates and temporarily arrests feces in their passage from the sigmoid to the anal canal.

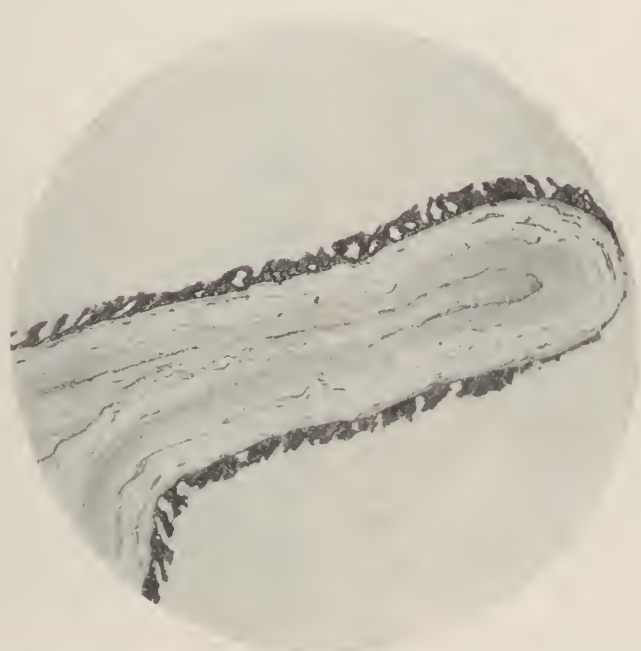


Fig. 19.—Microphotograph showing the mucosa, submucosa, and muscular coat at the tip of a rectal valve.

The average valve is composed of *mucosa* (Fig. 18), *submucosa*—fibrous tissue—*circular* and *longitudinal* muscle-fibers (Fig. 19), and *subserosa*—containing areolar tissue, arteries, veins, nerves, and lymphatics—and occasionally in the upper valve a slight *infolding* of the *peritoneum*.

The *mucosa*, which is continuous with that at base of the valve, is structurally the same as elsewhere. The *submucosa* which gives main support to the valve contains an abundance of white fibrous tissue; *circular muscle-fibers* usually constant may extend a short distance or to the valve tip; *longitudinal fibers* may enter into or

pass across the base of the valve (Fig. 19). Occasionally musculature is absent and the valve is composed of mucosa and submucosa. Houston's valves are frequently the site of *strictures*, and when hypertrophied are an etiologic factor in chronic rectal obstipation.

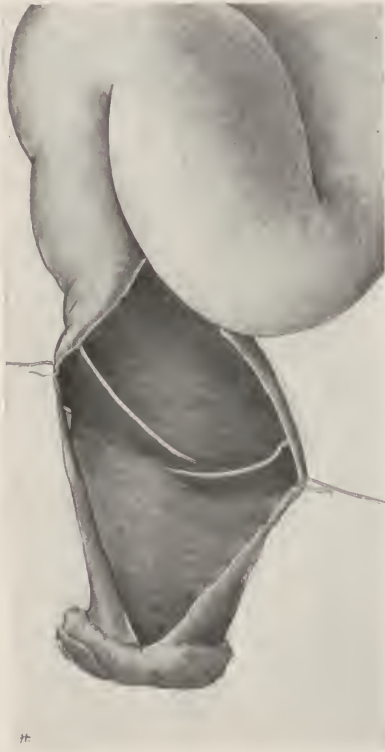


Fig. 20.—Paraffin-injected rectum with cast immediately removed, showing two rectal valves, one above the other, on opposite sides of the bowel.



Fig. 21.—Paraffin cast removed from the rectum, showing indentations made by the valves (cast from Fig. 20).

**Anus.**—The anus, or termination of the anal canal, is an oval orifice located between the perineum in front, coccyx behind, and tuber ischii at the sides that varies in size and is located further forward in women than men. The anal outlet is lined below by dark, loose, brown pigmented skin in which are found short hairs, sudoriferous and sebaceous glands, the latter supplying an unctuous secretion having an offensive odor.

The anal covering at Hilton's white line or blending point of mucosa and skin is pale, firm, smooth, and marks the sulcus intervening between the *external* and *internal* sphincter muscles, or

point of entrance for fistulæ. The anus possesses an abundant sensory nerve distribution, is not vascular, lined above by columnar and below by stratified—squamous—epithelium supported by fibro-cellular tissue and muscle-fibers, and is connected with two *raphé*—the *anal*, passing backward to the coccyx, and *perineal*, which

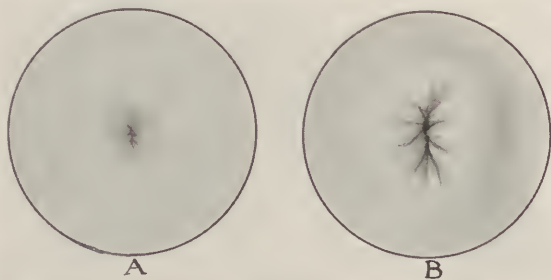


Fig. 22.—Appearance of (A) tightly contracted and (B) normal anus.

merges with the labia majora in the female and scrotal ridge in the male.

In repose the anus appears as an anteroposterior slit, but the skin on either side is thrown into radiating folds through action of the external sphincter and corrugative cutis ani muscles.

Size of the anus is modified by disease, and it is small and tightly closed (Fig. 22, A) when sensitive lesions—fissure, ulcers, etc.—induce sphincteric irritability, and is large and patulous (Fig. 23) when the anal muscle is paralyzed by brain or cord lesions, daily distended by protruding hemorrhoids, polyps or procidentia recti, fatigue incident to frequent evacuations or straining due to chronic diarrhea, stricture, tumor, or impacted fecal masses, and when the sphincter has been removed or destroyed by ulcerative lesions or Whitehead's operation.



Fig. 23.—Appearance of patulous anus.

**The Perineum.**—This structure, which differs materially in the sexes, is covered by dark brown, freely movable skin containing glands. The perineum, which in the *male* is bounded laterally by rami of the ischii, in front by the scrotum, and behind by the anus, is convex, triangular in form, and measures 3 inches (7.62 cm.) in one direction and  $2\frac{1}{2}$  inches (6.35 cm.) in the other—base—and a



pronounced raphé extends along its center, blending with the scrotal ridge. Under the skin is a layer of fascia continuous with that of the body, and beneath this a fascial sheath—superficial, perineal, Colles’—that blends with the dartos of the scrotum in front and extends from one ischiopubic ramus to the other that encompasses the perineal vessels and nerves, accelerator urinæ, erector penis, transversus perinei muscles, crura of the cavernosa, bulb of the corpus spongiosum, Cowper’s glands, and central tendon where muscles of the anoperineal region converge.

The *female* perineum shows a marked contrast to that of the male owing to the vaginal outlet. Here the *superficial* blends with that of the surrounding parts, while the *deep* fascia is adherent to the ischiopubic rami, and passes forward to the labii majora, and thence to the inguinal region. Lifting up of the fascia brings into view the transversi perinei superficialis, erector clitoridis, compressor urethri, external sphincter, and the sphincter vaginæ muscles, the central tendon of the perineum, lymphatics, perineal nerves, and vessels.

The female perineal *body*—superficial—lies between the terminal extremities of the vagina and rectum, is about  $1\frac{1}{2}$  inches (3.81 cm.) in its anteroposterior diameter, extends from one tuber ischii to the other, contains muscles of the external rectogenital organs, and a firm, central, ridge-like septum, which gives it strength and serves as a blending point for muscles inserted in this region.

**Arteries of the Anorectal Region.**—The following arteries participate in the blood-supply of the rectum and must be considered in anorectal extirpation and other operations.

The *superior hemorrhoidal* (Fig. 24), a continuation of the inferior mesenteric artery, below the lowermost sigmoid artery (Fig. 24), crosses the ureter and left common iliac vessels from left to right between layers of the mesosigmoid to the middle of the sacrum, where it branches, one going to supply the left anterior, the other the right posterior surface of the rectum.

These subdivisions form tributaries 4 inches (10.16 cm.) above the anus that penetrate the muscular coat through buttonhole slits and descend between muscularis and mucosa to the internal sphincter muscle, where, through the hemorrhoidal plexus, they anastomose with the inferior middle hemorrhoidal vessels (Fig. 24).

The *middle sacral* (Fig. 27), a small vessel from the aorta above its bifurcation, passes over the last lumbar vertebra and thence along the median sacral line to the coccygeal tip, where it anastomoses with the lateral sacral artery (Fig. 27).

The *internal iliacs*—hypogastrics—which are short and arise

at the bifurcation of the common iliac, are in relation with the psoas muscle above, descend to the great sacral sciatic foramen, where they divide into the *anterior* and *posterior* trunks. The *anterior* branch gives off the *middle hemorrhoidal* and *internal pudic*,

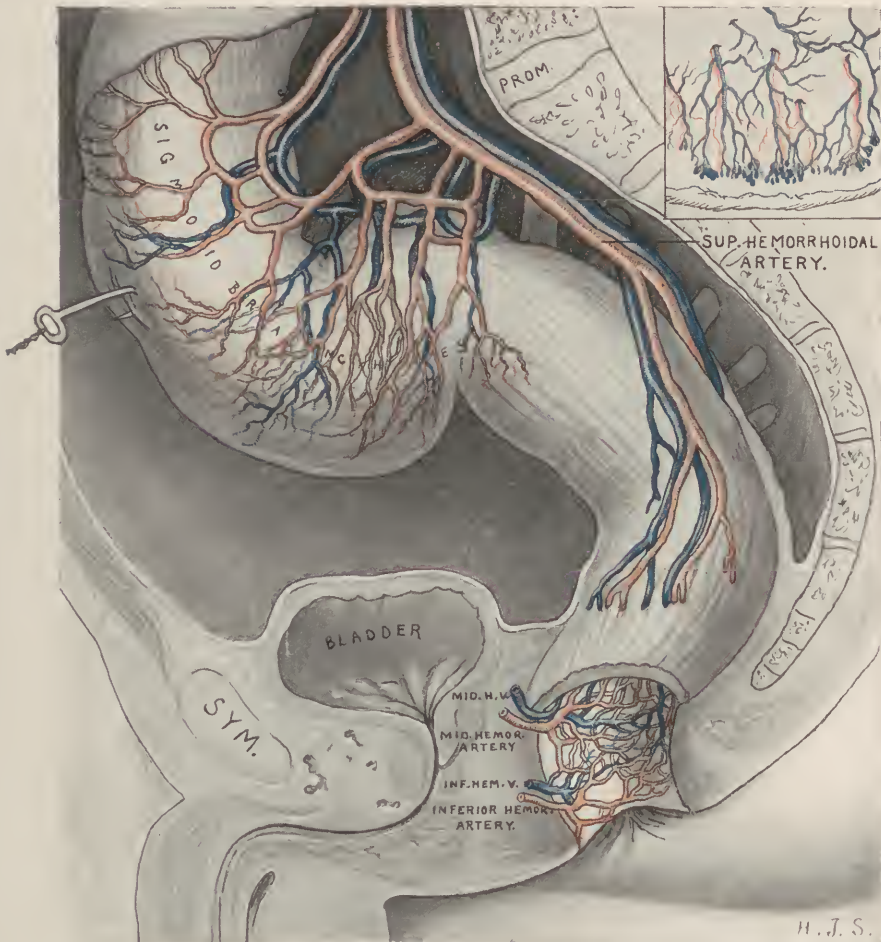


Fig. 24.—Arteries, veins, and capillaries of the sigmoid, rectal, and anal regions. Insert shows how vessels penetrate the rectal musculature, enter the mucosa, and pass downward, forming the hemorrhoidal plexuses in the anal canal, the site of hemorrhoids.

and the posterior trunk, the *lateral sacral artery*. The internal iliacs and branches supply the pelvic viscera, rectum, and anus.

The *middle hemorrhoidal* (Fig. 24) arises from the anterior branch of the internal iliac artery along with the inferior vesical, and, after distributing blood to the levator ani muscle, seminal

vesicles, and lower rectum, anastomoses with the superior and inferior hemorrhoidal (Fig. 24), and in conjunction with the middle sacral artery furnishes nutriment to the middle third of the rectum when the superior hemorrhoidal has been ligated.

The *internal pudic*, from the anterior trunk of the internal iliacs, follows an irregular course and eventually gives off several branches, of which the *inferior hemorrhoidal* artery is the most important. Tributaries of the internal pudic furnish blood to the penis, scrotum, skin, perineal muscles, and tissues between the anus and urethra.

The *inferior hemorrhoidal* (Fig. 24), an offshoot from the internal pudic, traverses the ischiorectal fossa to the lower rectum,

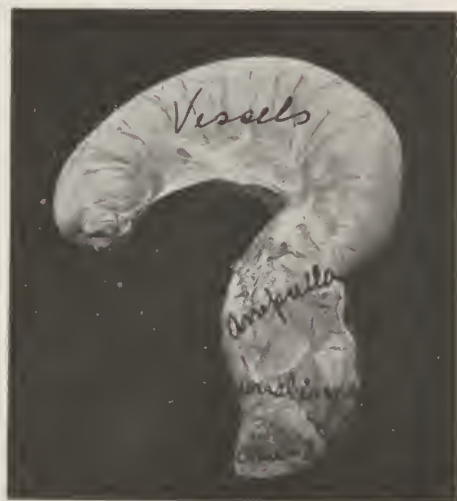


Fig. 25.—Lateral view of paraffin-injected rectum, showing mesentery, direction of blood-vessels, and peritoneum binding rectum and sacrum together.

where branches are given off to nourish the levator ani, sphincter muscles, cellular fatty and integumentary tissues of the perianal region, after which they anastomose with the middle and superior hemorrhoidal vessels.

The *hemorrhoidal plexus* (Fig. 24), or usual site of *hemorrhoids* (Fig. 24), is formed by the intermingling of arterioles and venules from the *superior*, *inferior*, and *middle* hemorrhoidal vessels (Fig. 24).

The *lateral sacral* (Fig. 27), from the posterior trunk of the internal iliac, divides into the *superior* and *inferior* branches, the former, after anastomosing with the middle sacral, distributes blood



to the skin, muscles, and dorsal surface of the sacrum, and the latter descends obliquely in front of the sacrum to anastomose with the middle sacral artery and fellow of the opposite side.

**Veins of the Anorectal Region.**—Rectal veins bear the same names and closely follow main arteries. The *superior hemorrhoidal* (Fig. 24) and tributaries collect blood from the inner rectum, from whence it is transported by way of the *mesenteric* to the *portal vein*, while venous blood coming from the outer surface of the lower rectum after entering the *inferior* and *middle hemorrhoidal* and *middle sacral* (Figs. 24, 27) veins passes into the general circulation by way of the *vena cava*.

Owing to the close relation between the superior middle and inferior hemorrhoidal plexuses there is a free circulation between the *portal* and *caval* systems of the anorectal region.

The *superior hemorrhoidal* vein (Fig. 24) and its tributaries originate in the submucosa about the mucocutaneous juncture in diminutive saccules at different levels, and from these grape-like clusters (Fig. 24) proceed venules that unite and form a complex network of veins that encircle the anal canal above Hilton's white line (Fig. 24), from which point venous trunks—six or seven—pass upward from the hemorrhoidal plexus with the arteries in parallel lines, an equal distance apart on all sides of the rectum.

These anorectal veins, *devoid of valves*, ascend beneath the mucosa to a distance of 4 inches (10.16 cm.) above the anus, where, with corresponding arteries, they pass through *button-like slits* in the musculature to the posterior surface of the rectum, where they converge posteriorly to form the *superior hemorrhoidal* vein (Fig. 24), which, together with the *sigmoidal* and *left colic* trunks, combine to form the *inferior mesenteric* vein (Fig. 27), which passes upward and to the left to empty into the *vena portal* by means of the *splenic* vein.

Contraction of the musculature about veins where they penetrate the rectal wall favors venous congestion in the lower rectum, and owing to the absence of valves to support the blood-column in these vessels the upright posture is a predisposing cause of internal hemorrhoids.

The *middle hemorrhoidal* (Fig. 24) and *middle sacral* veins collect most of the blood from the external surface of the rectum above the levator ani muscle, but some blood from the mucosa and muscularis reach these vessels owing to anastomotic connection with the middle inferior and superior hemorrhoidal plexuses.

The *middle hemorrhoidal* veins receive blood from the prostate and vaginal walls, lateral branches of which pass through the pelvi-

rectal spaces to join the iliac veins, which, in turn, empty into the *vena cava*.

The *inferior—external—hemorrhoidal* veins (Fig. 26) are supplied by the inferior hemorrhoidal plexus located beneath mucosa of the anal canal and skin at the sphincteric border. Tributaries from these vessels pass outward between the muscle and skin or through

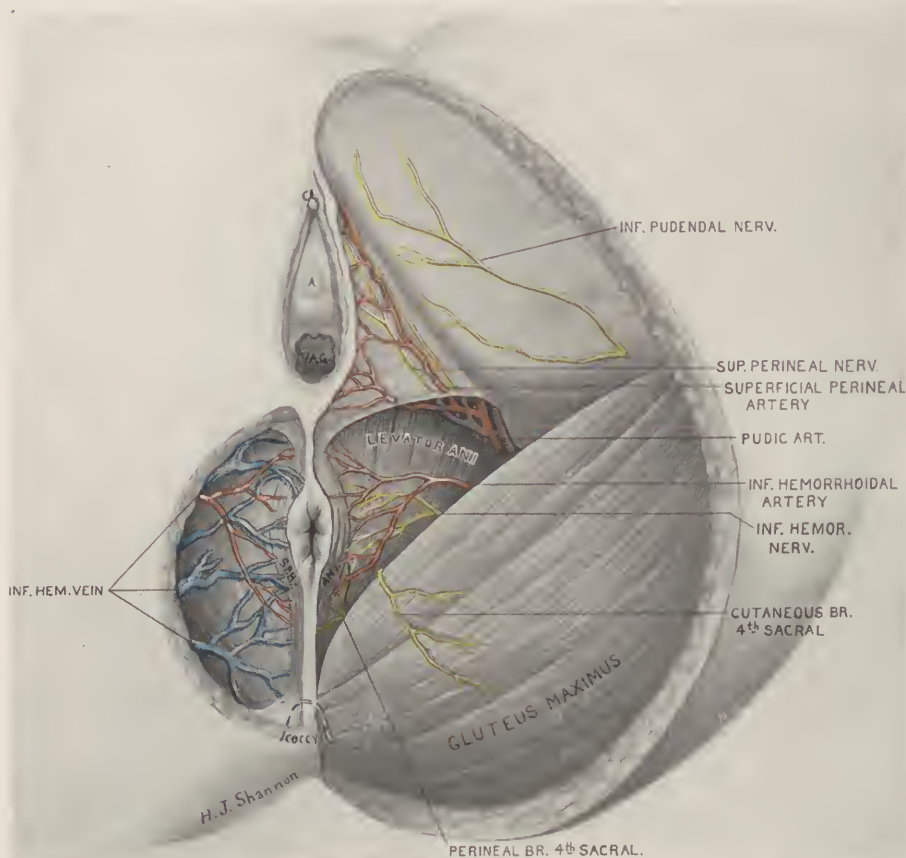


Fig. 26.—Important muscles, nerves, and vessels of the perianal, vulvar, and rectal regions.

the sphincter. The inferior hemorrhoidal traverses the ischiorectal fossa to the internal pudic vein, from whence blood is carried to the general venous circulation through medium of the internal iliac veins.

The *middle sacral*, which plays a minor if any part in the etiology of hemorrhoids, collects some blood coming from the posterior and external surface of the rectum and returns it to the caval system.

**Nerves of the Anorectal Region (Fig. 26).**—The anus and rectum (Fig. 26) obtain their nerve distribution from the *sympathetic* and *cerebrospinal* systems.

The rectum is supplied by sympathetic nerves coming from the *mesenteric*, *sacral*, and *hypogastric plexuses* distributed to the muscular coat, internal sphincter and rectal mucosa, filaments that terminate in gangliated plexuses—*Auerbach's*, between the circular and longitudinal muscle-fibers, and *Meissner's*, located in the sub-mucosa, and also by nerve-fibers derived from the *cerebrospinal* system—the *second, third, fourth, and fifth sacral* nerves, that branch, intermingle, and form intricate plexuses that supply the mucosa of the anal canal, levator ani, external sphincter, and perianal skin. The terminal nerve filaments distributed to muscles of the anorectal region have sensitive and motor fibers and are closely related with off-shoots from the sympathetic nerve.

Sensitiveness of the rectum increases from above downward, being most marked at the anus, which explains why fissures and other diminutive lesions in vicinity of Hilton's white line cause intense suffering, while cancers, large ulcerated areas, and strictures located in the middle and upper rectum induce little or no pain.

That there is a close relation between *centers* and *nerves* controlling the anorectal and genito-urinary regions is proved by the frequency with which disturbances of micturition and pain in the bladder, etc., complicate disease of the rectum, and vice versa.

Pain extending down the legs, a manifestation of sensitive lesions located at the anus, is explained by the center in the lumbar cord that governs both the inferior hemorrhoidal of the pudic and sciatic nerves; *inhibitive nerve centers* of the anal and vesical sphincters are located chiefly in the brain—probably optic thalamus—while the *center governing nerve mechanism* of the anorectal region is situated in the lumbar cord, and when the spinal column is seriously injured near first lumbar vertebra the external sphincter is paralyzed and the anus remains patulous. Fecal incontinence may *also* be induced by terror, causing temporary paralysis of the anal muscle.

**Superficial Nerves.**—See Chapter VI on Anesthesia (Fig. 100) for a distribution of *superficial* and *deep* (Fig. 26) nerves of the anorectal region concerned in local anesthesia operations.

**Lymphatics of the Anorectal Region (Fig. 27).**—Formerly it was thought there were only two lymphatic systems in this region, the *rectal* (Fig. 27), draining into the sacrococcygeal and prevertebral glands, and *anal* (Fig. 27), emptying into the inguinal nodes (Fig. 28), but this view has been exploded by Gerota, Quenu and Marcille, who demonstrated that quicksilver injected



into the circumanal—skin—lymph-vessels finds its way into the *anal* and *rectal* mucosa and also the *inguinal* glands (Figs. 27, 28).

The lymphatic system of the anorectal region originates in the perianal skin, mucous membrane, and musculature of the rectum, and is distributed through networks located subcutaneously between the mucosa and muscularis and beneath the serosa.

Lymphatics of the anorectal region may be grouped into those of the *perianal skin*, *neutral zone*, and *rectum* (Fig. 27).

*Lymphatics of the perianal skin* (Fig. 27) consist in a network of vessels extending *externally* and *internally*, of which several main trunks pass outward and upward, divide, and run along the crura-scrotal region to the upper and lower tiers of the inguinal glands, while less important cutaneous vessels course inward to join the *anal* glands, which, in turn, connect above with those of the *rectal* mucosa.

*Lymphatics of the neutral zone* anal region (Fig. 27) run upward to Morgagni's columns and are so named because the anal lining at Hilton's white line assumes characteristics of both *mucosa* and *skin*, and the network here connects the lymphatic systems of the integument and rectum (Fig. 27).

Quicksilver injected into these vessels diffuses in all directions, going to the inguinal nodes as well as lymphatic vessels accompanying the superior, middle, and hemorrhoidal arteries. Drainage from the anorectal mucosa is carried upward through slits in the rectal wall to the *ano—para—rectal* glands (Fig. 27), two to eight on either side, located laterally between the rectum and fascia propria, from whence they converge at the mesocolon, passing upward to the *prevertebral* nodes (Fig. 27).

The middle hemorrhoidal trunk, which is less constant, connects with a gland on the middle hemorrhoidal artery or divides, sending branches to a node located at the pelvic septum, central gland belonging to the inner chain of the external iliac group, and to the lateral sacral gland (Fig. 27).

Some vessels from the anal mucosa after emerging from beneath the levator ani pass through the ischiorectal fossæ and drain into a gland situated at the origin of the internal pudic artery, taking an independent course from those of the inferior hemorrhoidal artery.

*Lymphatics of the Rectum.*—Most lymph collected from the rectum (Fig. 27) as far down as Morgagni's columns finds its way into trunks accompanying the superior hemorrhoidal vessels that drain into the anorectal glands (Fig. 27), and also anastomose with nodes located in the mesosigmoid and prevertebral region (Fig. 27).

Gerota holds that the middle hemorrhoidal trunk, which is



inconstant, drains only the anal mucosa, while other authorities maintain the vessel receives lymph from both the anal and rectal mucous membrane, but if the latter contention is correct, it is

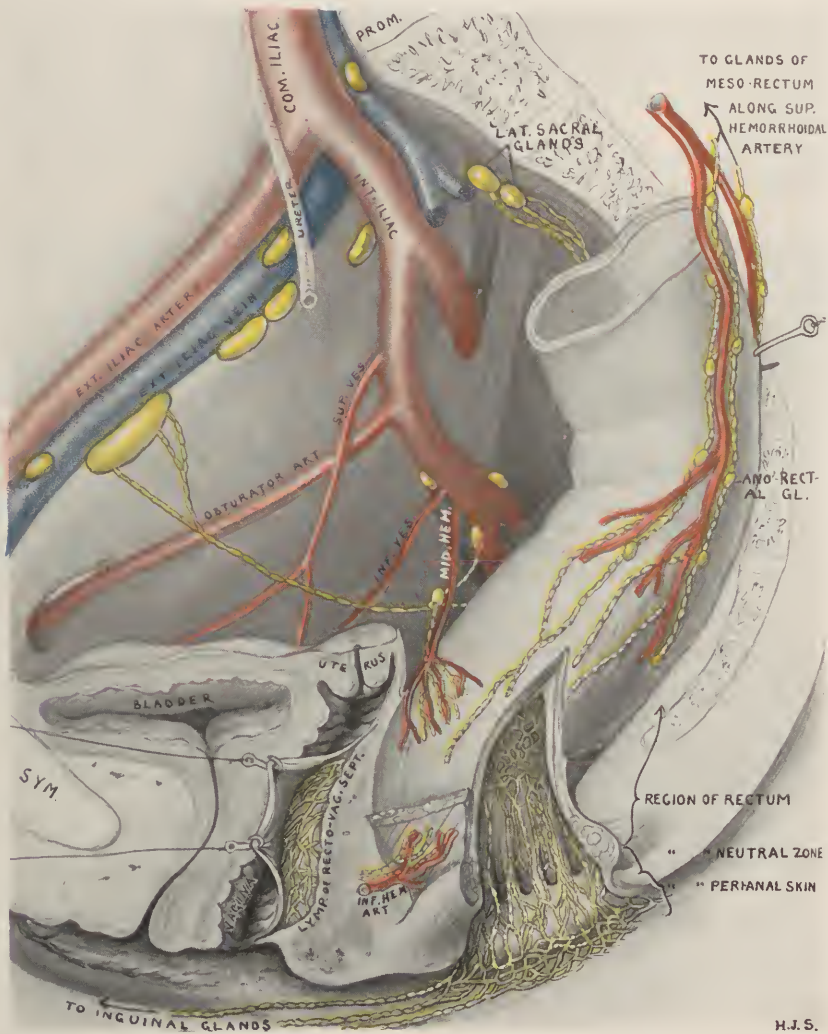


Fig. 27.—Relation of arteries, lymph-vessels, and nodes to the rectum, anal canal, and adjacent skin. Note position of large glands, arrangement of anorectal lymph-vessels, lymphatics of the rectovaginal septum, and manner in which infection may be carried through lymph-channels from the anal to the inguinal region in cancer case.

necessary when extirpating the rectum for cancer to remove lymph-glands and vessels associated with both the superior and middle hemorrhoidal arteries.

*Lymphatics of the Rectovaginal Septum.*—While there is a difference of opinion, most authorities concede there are two lymphatic trunks located near the center of the rectovaginal septum, and the author, from his knowledge of the anatomy of lymphatics in this region, and a study of numerous cancers involving the rectovaginal wall, is convinced there is a close relationship between the distribution of the *rectal* and *vaginal* lymphatic vessels (Fig. 27), that permit drainage from malignant growths of the rectum to the vagina, which often becomes involved, making necessary a wide operation that may include hysterectomy.

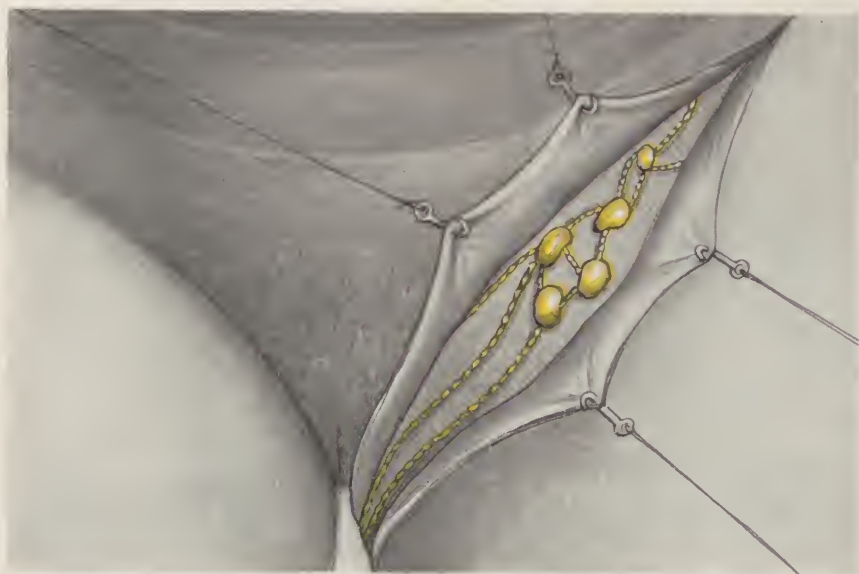


Fig. 28.—Inguinal lymph-glands and manner in which vessels from them track downward to meet those of the anus (Fig. 27). This explains why these glands become involved early in anal epithelioma.

*Surgical Importance of Anorectal Lymphatics.*—When the anal margin is malignant the *inner group of inguinal glands* (Figs. 27, 28) infiltrate early, but when the lesion is above Hilton's white line *anorectal* and *prevertebral* (Fig. 27) nodes only enlarge, but if, as claimed, the anal mucosa neutral zone (Fig. 28) drains in either direction, removal of both sets of glands may be necessary. When extirpation is being performed for malignant growths located in the rectum proper, extirpation of the *inguinal glands* (Fig. 28) is unnecessary. In early excision of rectal cancers removal of the *para-rectal* and *prevertebral* nodes (Fig. 27) is sufficient and easily accomplished by the perineal, sacral, or vaginal route, but when glands

associated with vessels above the pelvic brim are involved, combined rectal extirpation is advisable that all glands, fat in which they lie, and vessels receiving direct or indirect drainage from the neoplasm may be removed.

**Muscles of the Anorectal Region.**—An understanding of the muscles in this region is necessary that the proctologist may appreciate their relation to disease here, and take necessary measures when operating to preserve pelvic support and avoid fecal incontinence.

Most important of the muscles connected with the anus and rectum are: (1) *Corrugator cutis ani*, (2) *external sphincter*, (3)

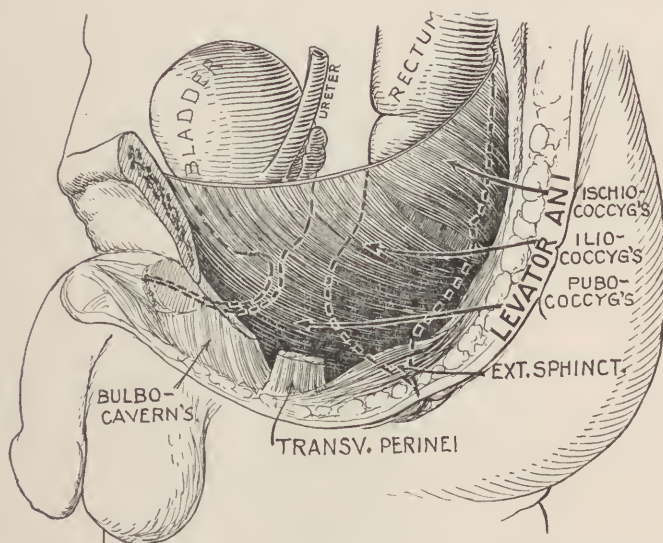


Fig. 29.—Side view showing relation of the levator ani and muscles to the bladder and rectum.

*transversus perinealis*, (4) *internal sphincter*, (5) *rectococcygeus*, (6) *coccygeus*, (7) *levator ani*, and (8) *sphincter vaginae*.

The *corrugator cutis ani* (Fig. 29) is a thin involuntary muscle surrounding the anus that blends internally with submucosa and externally with the integument, which, when contracted, throws the perianal skin into folds.

**External Sphincter.**—This ribbon-like muscle (Figs. 29, 30), which is voluntary, has a superficial and deep layer that surrounds or parallels the anus, is situated beneath the integument at the anal margin, and about 3 inches (7.62 cm.) in length and  $\frac{1}{2}$  inch (12.7 mm.) broad. It arises from the coccygeal and fibrous layer of the integument, and after surrounding the anus in the form of an ellipse is



inserted into the central tendon of the perineum. Most of the fibers parallel each other as far as the posterior commissure, where they separate and pass around the anus to the perineal body or sphincter vaginæ in women, while the remainder decussate, crossing over to the opposite side, and then forward to their insertion. Pain from sphincteric contraction is relieved by splitting the muscle posteriorly, demonstrating that if there were no decussating fibers, as some authorities hold, the operation would not bring relief.

The function of the sphincter is to close the anus and assist in the expulsion of feces, acting in conjunction with the abdominal and

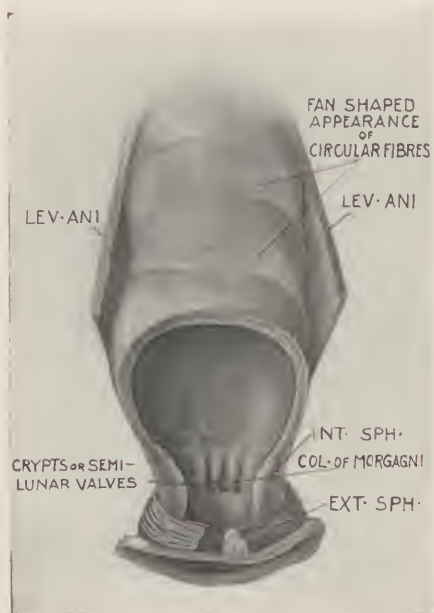


Fig. 30.—Relation of structures in and outside the rectum.

levator ani muscles. The surgeon has to deal more often with this than any other muscle of the anorectal region when treating or operating for the relief and cure of lesions situated at or near the anus.

The *nerve supply* of the external sphincter is derived from the fourth sacral and inferior hemorrhoidal of the internal pudic, and the center controlling it is situated in the lumbar enlargement of the cord.

The *transversus perinæi* (Fig. 29) arise by narrow tendons on the anterior surface of the tuber ischii and pass forward and inward to be inserted into the central tendon of the perineum, along with

the external sphincter in men or posterior attachment of the sphincter vaginae in women. It aids in defecation by pressing the anterior and posterior walls of the bowel together, in conjunction with the anal sphincter.

*Internal Sphincter.*—This involuntary muscle (Figs. 12, 30), which is formed by a collection of circular fibers continuous with those of the circular coat immediately above the external sphincter, is from  $\frac{3}{4}$  to 1 inch (19 mm.—2.54 cm.) in breadth and  $\frac{1}{6}$  inch (4.23 mm.) in thickness. Near the anus the lower border of the *internal* is overlapped by the *external* sphincter muscle, from which it is separated by an appreciable groove, the point of entrance of most fistulae at the posterior commissure. Formerly it was believed that incontinence followed cutting of this so-called muscle, which, in reality, is simply a continuation of the circular muscular fibers, but the author now believes that severing of the internal sphincter has but little if anything to do with the causation of fecal incontinence that occasionally follows fistulae operations.

*Rectococcygeus Muscles.*—United with the internal sphincter muscle are two unstriated bands that arise from the anterior surface of the coccyx and pass downward and forward, becoming lost in the rectal musculature and perianal fascia, known as the rectococcygei muscles (Fig. 29). They embrace the lower end of the rectum fork-like and help to draw the rectum upward and backward after it has been forced down during defecation.

*Coccygeus muscles* (Figs. 29–31) must be studied in connection with the levator ani, since their origin and insertion are almost identical with posterior fibers of this muscle which they parallel, and from which they are separated by narrow or slit-like cellular spaces, and because they functionate with the levator ani in restoring the coccyx to its position following defecation and in supporting pelvic organs.

The coccygei arise from the rami and spines of the ischii and descend inward and backward to their fibrous insertion at the lowest sacral vertebra and sides of the coccyx, thus forming a sort of triangle with its base above and apex at the coccygeal tip.

*Levator Ani*—Lifter of the Anus (Figs. 29–31).—The origin, insertion, and function of this muscle has been the subject of much study and controversy. The levator ani responds to both voluntary and involuntary stimulation, is broad, thin, and shaped like a shallow jardenier, being broad at the pelvic border and narrow below its rectococcygeal insertion (Fig. 31).

The origin and distribution of muscle-fibers composing the levator ani are numerous and complicated, hence for the sake of



brevity and clearness the author will describe only parts of the muscle of especial interest to the proctologist.

From dissections of and operations the author has observed that the main bundles of fibers arise from the inner surface of the symphysis pubis *anteriorly*,  $\frac{1}{2}$  inch (12.7 mm.) from the anterior white line, pelvic fascia *laterally*, where it blends with the obturator fascia, and from the ischial spine *posteriorly*.

For convenience of description the insertion of levator ani fibers may be separated into three groups: (a) those in front descending backward, to be inserted into the central portion of the

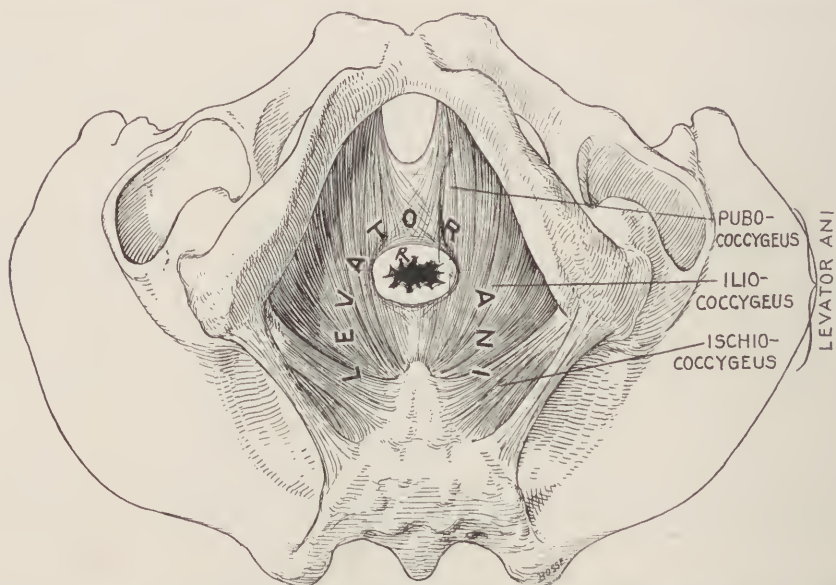


Fig. 31.—Relation of muscles composing the levator ani, and *R*, point at which the rectum passes through the muscle.

perineum after having embraced the prostate and the urethra—vesical juncture; (b) middle group, which send fibers obliquely downward and backward to the tip and anterior surface of the coccyx, (c) those that pass forward blending with the external sphincter, and (d) still others—a larger number—that join the rectum as the muscle passes around it (Fig. 30). Some of the levator ani fibers cross the rectum at almost a right angle about  $2\frac{1}{2}$  inches (6.35 cm.) (Fig. 33) above the anus, but the majority approach and are inserted into the rectum at a less acute angle (Fig. 31).

The levator ani muscles compose a broad partition that forms

the chief pelvic support, and when they contract raise the pelvic floor and assist in evacuating bladder and bowel by compressing the abdominopelvic viscera and rectum.

Usually when the sphincter relaxes to open the anus this muscle contracts, closing the urethra, and vice versa during micturition, which explains why man cannot defecate and urinate at the same time unless frightened or nerve-centers controlling the sphincter and levator ani are paralyzed.

When a movement is about to take place the levator ani draws the anal canal upward over feces near the anus as the sphincter relaxes, permitting the evacuation to take place.

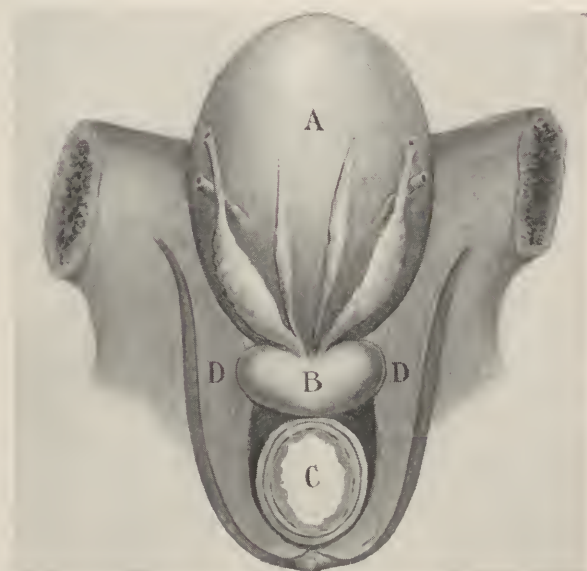


Fig. 32.—Another view showing relation of the levator ani muscle to rectum as seen from above: A, Bladder; B, prostate; C, rectum; D, levator ani. (Cripps.)

The muscle helps to complete the act of defecation by compressing sides of the lower rectum as the last of the fecal bolus approaches the anus. The levator ani are classified as involuntary muscles, but they are partly under control of the will, a fact easily demonstrated by introducing the finger and requesting the patient to draw the rectum upward, when marked contraction of the levator will be felt 2 inches (5.08 cm.) above the anus.

The author has treated many constipated individuals where these muscles, as a result of some chronic rectal lesion, had become *hypertrophied*, *irritable*, and *contracted*, acting as a barrier to expulsion of the fecal mass or causing fragmentary stools by alternately

relaxing and contracting during defecation, a condition corrected by the operation.

Several patients have been treated by the author where both the internal and external sphincters had been destroyed, who retained partial or complete control over solid feces owing to the action of the levator ani muscles which they had learned to control. Partial control over movements following rectal extirpation in-

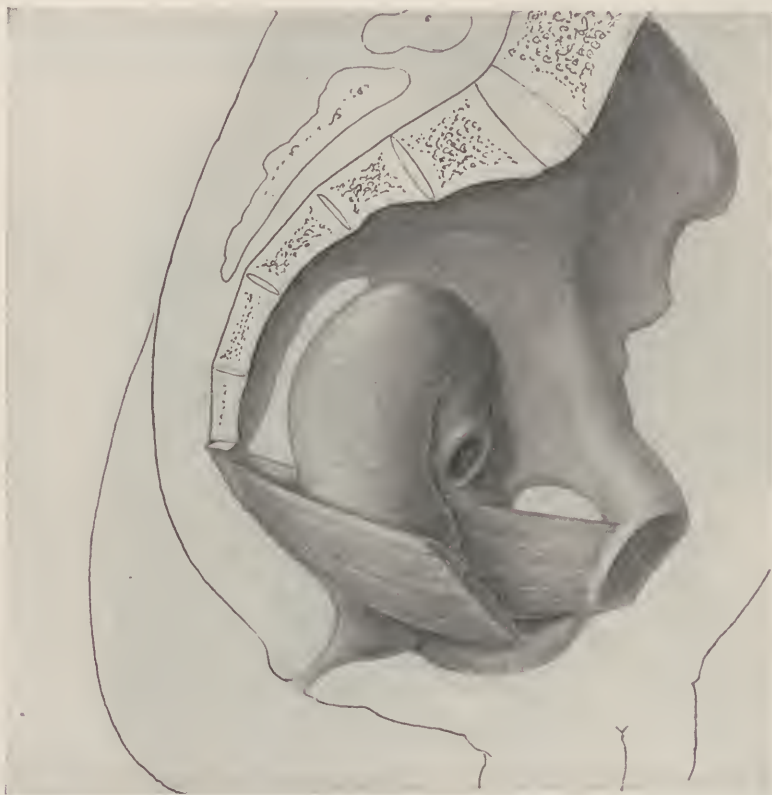


Fig. 33.—Showing relation of the levator ani to the rectum. This muscle when hypertrophied or irritable induces mechanical constipation by contracting before or about the time feces are expelled.

cluding the sphincter is obtained by snugly suturing the levatores ani about the new rectum.

The lifting power exerted by these muscles is noticeable in fissure cases where a *funnel-shaped anus* is produced through their contraction, and where the patient complains of sudden jerking upward of the rectum following sphincteric divulsion after anorectal operations.

*Sphincter Vaginæ*.—The vaginal sphincter (Fig. 26) encompasses the vagina, blending posteriorly with the external sphincter in the central tendon of the perineum, where some fibers decussate and pass forward and upward on either side of the vaginal outlet, to be inserted in the corpora cavernosa of the clitoris. Division of the external sphincter anteriorly is sometimes followed by partial or complete incontinence owing to action of the vaginæ in keeping the sphincter ends separated, which prevents their uniting as healing takes place.

**Relations of the Rectum.**—The rectum is in close relation with the small intestine, sigmoid flexure, sacrum, superior hemorrhoidal artery, peritoneal reflection—rectovesical pouch or Douglas' culdesac—ureters, bladder, seminal vesicles, prostate gland or vagina, fascia propria, cellular tissue, lateral sacral arteries, hypogastric nerves, sacral plexus, sympathetic ganglia, coccyx, Luschka's gland, levator ani, rectococcygeus and sphincter muscles, and membranous urethra in men or perineal body in women.

Owing to fibrous cellular tissue surrounding the rectum and spaces intervening between it and other structures the rectum can usually be extirpated without serious injury to vital parts in close relation to it.

**Rectal Supports.**—The rectum possesses a limited vertical and lateral motion owing to supporting structures which are numerous, non-elastic, surround, and convert it into an irregular fixed cylinder.

Chief supports of the rectum are the superior hemorrhoidal artery, sacrum, peritoneal reflections, fascia propria, bladder, vagina, uterus, levator ani, rectococcygeus and sphincter muscles, perirectal connective tissue, connecting spinæ ligamentus structures, lateral sacral arteries, and thickness of its muscular wall.

**Retrorectal and Pelvirectal Spaces.**—The movable rectum is surrounded by loose connective tissue and fat incased in a fibrous sheath—an extension of the pelvic fascia which also forms the lateral ligaments of the rectum. Between fascial layers posteriorly separating the rectum from the sacrum is a cellulovascular area, the *retrorectal space* (Fig. 34). Anteriorly above the levator ani muscle the rectum is separated from the bladder, prostate, and seminal vesicles in men and the broad ligaments and uterus in women by the *prerectal*—*pelvirectal* (Fig. 35)—*space* which is partitioned from the retrorectal space by the lateral rectal ligaments—fascia (Fig. 35). Unimportant spaces are sometimes demonstrable at the sides of the rectum.

These spaces and the ischiorectal fossæ (Fig. 35) are of surgical importance because of the frequency of infection and formation of



abscesses within them, that terminate in *horseshoe* fistulæ when pus escapes from one cavity to another.

**Ischiorectal Fossæ.**—On either side of the lower rectum between it and the tuber ischii are large fat-filled spaces—the ischio-

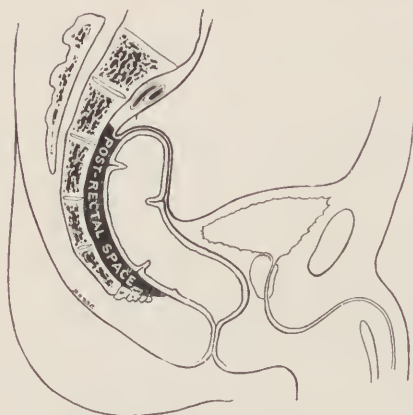


Fig. 34.—Posterior rectal space.

rectal fossæ (Fig. 35). They are triangular in shape, with the apices upward and their bases directed toward the skin. Their depth varies from  $1\frac{1}{2}$  inches (3.81 cm.) in front to 2 inches (5.08 cm.)

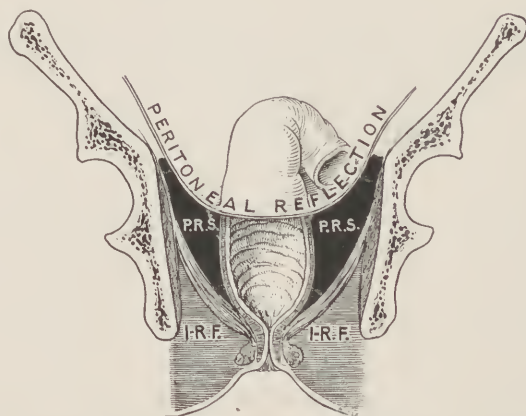


Fig. 35.—Relation of peritoneal reflexion: *P.R.S.*, Pre-rectal spaces; *I-R.F.*, ischio-rectal fossæ.

behind, and at their lowermost and broadest part they are a little more than 1 inch (2.54 cm.) in width.

*Internally* these spaces are in relation with the external and internal sphincters, coccygeus and levator ani muscles; *externally*



with the tuber ischii obturator fascia; *anteriorly* with superficial and perineal fascia, and *posteriorly* with the border of the gluteus maximus muscles, and investing fascia which is continuous with the great sacrosciatic ligament. Within a sheath formed by the obturator fascia are found the *internal pudic artery, veins, and nerves*. The *inferior hemorrhoidal* vessels and nerves pass through the central portion of the ischiorectal fossæ on their way to the anal canal; and in the anterior part of these spaces are located the *superficial perineal vessels and nerves*. Fat and connective tissue filling the cavities act as elastic supports for the rectum, and are partially responsible for the lateral rectal walls remaining in contact.

The ischiorectal fossæ are of surgical importance because of the frequency with which extensive abscess and fistula are associated with them.

The connective tissue within divides to form intercommunicating small compartments, which become infected in periproctitis, with the result that large ischiorectal abscesses form, which when opened and explored show many diminutive loculi or pus cavities.

**Pelvic Fascia.**—This, a continuation of the iliac and transversalis fascia, which spreads out, lining the true pelvis, is of surgical importance, and should be considered in major operations because of the support rendered by it to the rectum, perirectal vessels, nerves, lymphatics, levator ani, and pelvic organs.

The **rectovesical fascia** (Fig. 32) is a prolongation downward and inward of the pelvic fascia from the white line to the superior surface of the levator ani muscle, prostate gland, bladder, rectum, and seminal vesicles. The layer coming from the symphysis pubis passes on either side to the upper surface of the prostate and neck of the bladder to form the anterior and lateral vesical ligaments. Prolongations also encircle and cover the seminal vesicles. Space prevents a complete description of the anatomy of the pelvic and rectovesical fascia.

**Coccygeal Body (Luschka's Gland).**—In 1859 Luschka discovered a small body, split-pea size, upon the inner surface of the second coccygeal segment in the space between insertions of the levator ani muscle attached by a pedicle composed of small, club-shaped branches of the middle sacral artery and sympathetic nerve filaments. It appeared to be made up of corpuscles held together by connective tissue inclosing glandular elements receiving its nerve supply from the coccygeal ganglion. Arnold disproved the *glandular* theory by injecting the middle sacral artery and filling the body, thereby demonstrating it to be composed of terminal

branches of the artery resembling a bunch of grapes, and renamed it the "glomeruli arteriosi coccygei."

Banks described it as having a gelatinous appearance, and containing numerous cavities filled with cells and granules encircled by nucleated fibers and arterial twigs with the usual endothelial lining, and maintained the body had no *specific* function since it was a vestigial remnant.

The **pelvis** varies in size in sexes and different individuals. The *female* differs from the *male* pelvis in being more round, broad,



Fig. 36.—Normal pelvis radiographed at Broad Street Hospital.

delicately constructed and shallow, having a less pronounced sacral prominence and coccyx, with a greater degree of mobility. The pelvis is heart shaped (Fig. 36), with the base directed to the spine and apex pointing toward the symphysis pubis, and the contained urogenital structures lie in the anterior, while the rectum, perirectal structures, and anus are located in the posterior half of the pelvis.

Diameters of the true pelvis in women are: *anteroposterior*,  $4\frac{3}{4}$  inches (12.06 cm.); *oblique*, 5 inches (12.70 cm.); *transverse*,  $5\frac{1}{4}$  inches (13.34 cm.), and the *outlet*, anteroposterior,  $4\frac{1}{2}$  inches (11.43 cm.),

and transverse,  $4\frac{3}{4}$  inches (12.06 cm.). For purpose of enabling one to definitely locate pathologic lesions of the pelvis it is well to divide the outlet into quadrants (Fig. 40) by drawing imaginary lines which intersect each other in the center, the *first* from the symphysis pubis to the coccygeal tip, and the *second* from the anterior surface of one ischial tuberosity to the other, thus making the *right* and *left anterior* and the *right* and *left posterior* quadrants.

## Chapter III

### Diagnostic Significance of Manifestations Pointing to Anorectal Disease

MANY individuals suffer from constipation, diarrhea, or other affection of the small intestine, colon, or rectum who unnecessarily become chronic invalids because their early symptoms go unrecognized or are considered unimportant.

Some manifestations point to lesions in the bowel and others to disease elsewhere that disturbs the intestine *directly* by *extension*, or *indirectly* through *reflexes*; hence analysis of symptoms is imperative if the condition behind them is to be diagnosed early and the patient relieved or cured without prolonged treatment or serious operation.

Normally the small and large intestines functionate smoothly, and one is unconscious of their existence except during defecation; but when colic, soreness, pain, tenderness, or gas accumulations are complained of, when there is a burning sensation of weight or bearing down in the rectum, protrusion through the anus, inflammation or itching of the perianal skin, blood, pus, or mucus in the stools, swelling upon the buttocks, discharge from the bowel or a fistulous opening in the anal region, the upper or lower bowel is abnormal and symptoms must be studied and the patient carefully examined to ascertain what is causing the disturbance.

Though manifestations are many and varied in different recto-colonic affections, valuable information is gained by their analysis and ascertaining their individual significance. While a correct diagnosis may sometimes be arrived at by grouping and studying symptoms, one is not justified in making a positive diagnosis until he has obtained a careful history, palpated the abdomen, examined the pelvis bimanually, and the sigmoid flexure and rectum with finger and sigmoidoscope, and inspected the perianal region.

That the reader may more easily distinguish between colonic, sigmoidal, rectal, and anal *symptoms* accompanying affections of the lower bowel, differentiate between intestinal manifestations caused by local, general, and disease originating in neighboring organs, and more fully appreciate the diagnostic importance of such signs and symptoms, the author has separately enumerated and discussed them in order of their importance.



## MANIFESTATIONS AND SIGNS OF ANORECTAL DISEASE

- |  |   |
|--|---|
| 1. Pain.                                     | 22. Pricking or sticking sensation and pain.                |
| 2. Hemorrhage.                               | 23. Funnel-shaped entrance to rectum.                       |
| 3. Discharge.                                | 24. Irritability and hypertrophy of the levator ani muscle. |
| 4. Protrusion.                               | 25. Skin-tags.  |
| 5. Itching.                                  | 26. Hypertrophied sensitive anal papillæ.                   |
| 6. Tenesmus.                                 | 27. Inflamed crypts.  |
| 7. Tenderness.                               | 28. Hypertrophic excrescences of the mucosa.                |
| 8. Straining.                                | 29. Dilatation of the rectum.                               |
| 9. Indurated areas.                          | 30. Fecal impaction.  |
| 10. Swelling.                                | 31. Abnormal sitting or standing posture.                   |
| 11. Altered feces.                           | 32. Flatulence and tympanites.                              |
| 12. Odors.                                   | 33. Indigestion.  |
| 13. Frequent desire to stool.                | 34. Constipation.   |
| 14. Openings in the rectum or perianal skin. | 35. Obstipation.  |
| 15. Condylomata.                             | 36. Diarrhea.   |
| 16. Inflammation and discoloration of skin.  | 37. Intestinal auto-intoxication.                           |
| 17. Sphincteralgia.                          | 38. Sepsis.   |
| 18. Relaxed sphincter.                       | 39. Cachexia.   |
| 19. Fecal incontinence.                      | 40. Loss of weight.   |
| 20. Postsacral dimples and discharge.        | 41. Abnormal pulse and temperature.                         |
| 21. Burning in the rectum.                   |   |

**Pain**, the most frequent and distressing manifestation encountered in the anorectal region, may be *acute* or *chronic*, *interrupted*, *paroxysmal* or *continuous*, *local* or *reflected*, *mild* or *severe*, of short or long duration, come on suddenly or gradually, precede, accompany, or follow defecation, be located at the anus or in the rectum, pelvis, abdomen, coccygeal, sacral, vesical, or prostatic region, and be *sharp*, *dull*, *excruciating*, *pricking*, *burning*, *throbbing*, *gnawing*, *crawling*, or *bearing down* in character.

Feces in the rectum mostly intensify suffering, while defecation usually minimizes or arrests pain. The significance of different types of pain accompanying diseases of the anus and rectum are briefly summarized below:

*Slight* during and *severe drawing* pain—sphincteralgia—shortly following defecation indicates fissure in ano or painful ulcer; a burning sensation—catarrhal, specific, or malignant proctitis, bearing down feeling—with rectal fulness and straining—fecal impaction, tumor, stricture, foreign body, invagination of the sigmoid flexure into the rectum or prostatic enlargement; *sensitive, inflamed perianal skin*—ulcerative proctitis, fistula, cancer, fissure or chancroids causing an acrid discharge; *pain down the limb and in the sacrococcygeal region*—fissure in ano, postsacral dermoid or necrosis of the sacrum or coccyx; *continuous throbbing* pain and septic manifestations—*pelvic, ischial, or marginal abscess*; *paroxysmal* or *continuous drawing* pain at the anus accompanied by protrusion—*prolapsed recti, hemorrhoids* or *polyp*; *crawling, sticking, or itching sensation*—*intestinal parasites, membranous proctitis, discharge, diminutive foreign bodies* or *fecoliths*; *heavy, dull aching* in the sacral,



*prostatic, or lower rectal regions with frequent micturition without visible lesions—irritation or hypertrophy of the sphincter or levator ani muscles; continuous dull pain in the middle rectal, vesical, and sacral regions with constant desire to evacuate the bowel—extensive submucous abscess, stricture, tumor, third degree procidentia recti, or enlarged prostate; coccygeal, pelvic, gas-pains, cramps or tenderness and fulness with constipation, auto-intoxication cachexia—a growth or chronic intestinal obstruction in the upper rectal or sigmoidal region; sharp interrupted pain in the anal region with thickening of skin folds or skin-tags—external cutaneous hemorrhoids, sphincteralgia plus a dark bluish swelling located at the mucocutaneous margin—a thrombotic hemorrhoid; sharp pain at the anus marked by continuous contraction of the sphincter muscle, numerous narrow, lengthy, foul-looking fissures bathed constantly in a discharge—chancroids; slight discomfort in the lower rectum with sphincteric irritability and a single round raised lesion having a smooth edge—a chancre; discomfort or severe pain with tenesmus in the penile, prostatic, or vesical region—large indurated internal hemorrhoids, ptosis of the sigmoid or tumor on the anterior rectal wall; sticking pain in the anal region, paroxysmal contraction of the sphincter—lodgment of fish-bone or sharp object in the mucosa; itching pain—thread-worms or seeds in the anal canal discharge or a diminutive fecal mass lodged in a lesion within the anus or pruritus ani; recurring sensation of weight in the middle rectum relieved by defecation—hypertrophy of the rectal valves; burning pain, diarrhea, and discharge containing pus, blood, mucus, and tissue débris—rectocolonic papillomata or carcinoma, multiple polyps—polyposis, frequent abdominal gas-pain and distention, digestive disturbances, occasional diarrhea, undigested food remnants in the stools and recurring occipital headaches accompanied by colic—obstipation, localized colonic soreness, feeling as if the bowel was blocked at a definite point and colic spastic constipation or enterospasm, loss of weight, cachexia, pus, blood, and mucus in the stools, hepatic, gastric, duodenal, or pancreatic disturbances, constipation alternating with diarrhea and frequent desire to stool—cancer of the small intestine, colon, or rectum.*

**Hemorrhage.**—Bleeding frequently complicates rectal affections; old clotted blood is encountered following hemorrhage from lesions in the stomach, intestine, or rectum where blood has been retained. *Bright red—fresh—blood points to a lesion, fissure, hemorrhoids, neoplasm, or ulcer in the anal canal.*

Bleeding may be *slight* or copious when caused by extensive or deep ulcers, cancer, or internal hemorrhoids, but is usually *slight* when due to fissures, diminutive ulcers or tears, expulsion of hard

fecal masses; when after a movement feces are *streaked* with blood and the patient suffers from *sphincteralgia*, a *fissure* should be suspected, but when there is *protrusion* and *considerable hemorrhage* the patient probably has *internal hemorrhoids*. Occult blood is an evidence of gastroduodenal lesions and currant-juice discharge points to intussusception.

Some idea may be obtained as to the nature of the lesion by determining whether bleeding takes place *before*, *during*, or *following defecation*. Hemorrhage may also complicate *stricture*, *polyps*, *fistula*, *procidentia recti*, or any type of ulcerative lesions of the mucosa.

Unless blood shows *outside*, there are no indications of *slight* bleeding; but when a patient suddenly complains of an *incessant desire for an evacuation*, *sensation of fulness in the rectum*, *intense colic*, *marked abdominal distention*, has a *fast weak pulse*, and is *extremely pale* or *faints* following an illness or operation, it indicates that he is having or has had a *serious hemorrhage* and death will likely ensue if bleeding is not promptly arrested.

**Discharge.**—Considerable information is obtainable from a close study of abnormal discharges. The appearance of dark tarry or *clotted* points to upper intestinal, and the presence of *fresh blood* in the feces to low or rectal lesions. *Jelly-like*, *stringy*, and *membranous mucus* are manifestations of *enterocolitis* and *proctitis*. Pus is encountered in the stools of patients suffering from *catarrhal* or *specific* (tubercular, gonorrheal, syphilitic, amebic, balantidic, or bacillary) *ulcerative colitis*, *diverticulitis*, *multiple polyps*, partially *encysted foreign bodies*, *fistula*, *cancer*, and extensive lesions of the mucosa. Frequently in aggravated cases *blood*, *mucus*, and *pus* admixed with *tissue debris* appear in feces, indicating serious changes in the intestinal tunics. The amount of discharge is *directly proportionate* to *extent* of the lesion. When the discharge has an *obnoxious odor* it probably comes from the *colon* or *small intestine* and has been *retained* for a considerable time.

*Thick yellow pus* in the stools or about small openings in the anorectal region suggests a *fistula*, *diverticulum*, or *abscess*, but when pus is thin and rice colored it probably comes from tubercular foci.

**Protrusion.**—The author has observed cases where *impacted feces*, a *foreign body*, or *cancer* projected through the anus, but usually *protrusion* is a manifestation of *hemorrhoids*, *procidentia recti*, *polyps*, or *enlarged anal papillæ*.

Protruding *internal hemorrhoids* frequently encountered are recognized by their *number* and *segmental attachment*. Children are frequently and adults more rarely afflicted with *procidentia recti*,

but in either case the protruding mass is *cone shaped*, has a *slit in the end*, is covered by *mucous membrane attached about the entire circumference* of the bowel, and *projects from one to several inches* through the anus; features that distinguish it from hemorrhoids and polyps, with which it is often confused.

**Polyps**, usually complicating bowel affections accompanied by an *acid discharge* that continually irritates the mucosa, may be *firm or fragile*, have *large, round, smooth, or irregular* extremities, may *extrude through the anus*, and be attached by a *narrow or thick pedicle distinguishable* by passing the finger around its base. *Reddish* protruding masses are *recent*, but when *black* and of an *offensive odor* the protrusion has existed for *several hours or days* and is being strangled by the sphincter muscle.

**Pruritus Ani.**—Itching is a common manifestation of recto-colonic affections causing a *discharge*; is often annoying after *operations* about the anus where the wound is not frequently cleansed, occasionally induced by *thread-worms* and *other parasites, fecoliths*, seeds, and diminutive foreign bodies caught in the anal mucosa or rectum. Frequently, however, itching at the anus is induced by the escape of *mucus* through the anus, where patients suffer from *proctitis*. Occasionally intense pruritus ensues when a dressing has *remained too long or been improperly* placed in a wound, and where *vermin or skin affection* causes irritation.

**Tenesmus.**—Uneasiness and drawing sensations in the rectum usually complicate *thread-worms, lesions accompanied by discharge, small foreign bodies* within the anal canal, *cryptitis, fissures, ulcers*, and *thrombotic hemorrhoids* located within grasp of the sphincter muscle.

**Tenderness in the Anorectal Region.**—Tender spots about the anus and rectum may evidence *hypersensitive areas* in the *skin or mucous membrane, encysted foreign bodies, abscess, recent fistula, fissure, ulcer*, or other lesions.

**Straining.**—A frequent or constant desire to *empty the bowel* accompanied by a sensation of *non-relief* following defecation is a sure sign that the rectum is *blocked by a tumor, stricture, fecal mass, foreign body, thickened rectal valves*, or hypertrophy of the *levator ani or sphincter muscles*.

**Indurated Areas.**—Hardened areas in the rectum or upon the buttocks characterize *abscesses, buried foreign bodies, prostatic inflammation or enlargement, diverticula, encysted feces, and fistulæ*.

**Swelling.**—Enlargements which appear suddenly, are tender, cause *throbbing pain*, and accompanied by a *chill and rise of temperature* are usually *abscesses; tumors with a pedicle are polyps;*



those having a *broad base extensively involving the bowel tunics*, where the patient is *cachetic* and has *rapidly lost weight*, are probably *malignant*; *large non-sensitive oval swellings of the buttocks that do not produce symptoms* are *lipomata*; *cone-shaped swellings covered by the mucosa* indicate *prolapsus ani*; *multiple segmented bluish-red tumors at the anal margin* are *internal piles*, *swollen skin-tags*; and *external dark bluish, hard, olive-shaped, pea- or cherry-sized tumors at the anal margin* are *cutaneous or thrombotic hemorrhoids*.

**Altered Feces.**—The *color, consistence, and form* of evacuations vary in disease of the small intestine, colon, and rectum. *Diarrhea with undigested food remnants* complicates *gastrogenic and enterogenic disturbances*; frequent movements where feces contain *jelly-like, stringy mucus*, or, in addition, *pus and blood* are encountered in *catarrhal and specific enteritis, colitis, and proctitis*; *light yellowish evacuations, jaundice, and diarrhea* are common in *hepatic and parasitic disorders*; *white feces in obstructed ductus communis choledochus*. Solid feces discharged in *fragments* are a sign of *irritability or hypertrophy of the sphincter or levator ani muscles*; *pencil or tape-shaped stools* are frequently encountered in *rectal strictures*, and when the fecal bolus is *grooved* the patient usually suffers from a *polyp, cancer, or hemorrhoids* in the lower rectum or anal canal.

Obstipation followed by the evacuation of *foul-smelling mucus or blood-smeared scybala*, with *localized tenderness in the rectum or colonic region* point to *mechanical obstruction*. Delayed evacuations where the feces are *dry and hard*, in the absence of other symptoms, evidence *atonic constipation*.

**Odors.**—Normal odors emanating from the rectum and perianal skin and feces are *offensive*, but not nearly so *disgusting* as those induced by *cancer and chronic ulcerative lesions of the colon and rectum—colitis and proctitis—causing diarrhea*. *Excessive fermentation and putrefaction* are responsible for *foul-smelling stools*, but the most *disgusting odor* comes from *long-retained discharge* composed of *mucus, clotted blood, pus and decaying tissue débris*, and stench of *gangrenous periproctitic abscess*.

**Frequent Desire to Stool.**—This sensation is frequently caused by *fecal impaction, stricture, cancer, indurated hemorrhoids, intestinal parasites, acrid discharge, and foreign bodies*, and the desire for an evacuation is not relieved by defecation when thus produced.

**Openings in the Rectum or Perianal Skin.**—Holes in the rectum or upon the buttocks are the outward signs of *fistula*.

**Condylomata** are the external manifestations of a *chronic, irritating discharge* that exudes through the anus induced by *gon-*

*orrhæal, syphilitic, or other type* of coloproctitis or fistula, that keeps the skin constantly moist and irritated.

**Inflammation and discoloration of the perianal skin** follows continuous bathing of the integument by discharges coming from *rectal abscesses, fistulæ, strictures, cancer, polyps, fissure, hemorrhoids, and ulcers* in the mucous membrane.

**Sphincteralgia.**—Paroxysmal contractions of the anal muscle are observed in *fissures, ulcers, cryptitis, papillitis, polyps, foreign bodies*, or lesions irritating the sphincter.

**Relaxation of the sphincter** may be induced by *fatigue* incident to *diarrhea* and straining, *repeated divulsion* of the muscle with fingers or instruments, Whitehead's operation for hemorrhoids, division of fistulæ, proctectomy for cancer, procidentia recti, pederasty, *ulceration* at the *anal margin*, stricture, cancer, or polyps in the lower rectum, and *brain and spinal injuries* or *lesions* affecting centers controlling the muscle.

**Fecal incontinence** ordinarily is a symptom or sequel of *nerve destruction* in the anal region, *disease* or *injury* in the *sacral* or *lumbar segment* of the *spinal cord*, *stricture*, or *cancer*, but most often it is caused by a fistula, Whitehead operation, rupture of the sphincter during forcible divulsion, or operation where the anal muscle is divided.

**Postsacral Dimple and Discharge.**—These signs are unmistakably those of a *dermoid cyst* located between the sacrum and overlying skin.

**Burning in the rectum** may be incident to proctitis, retained *foul secretions, acrid feces, topical applications, or medicated enemata*.

**Pricking or sticking sensation and pain** are an indication of *ulcerative lesions* causing a *discharge, seeds* caught in mucous folds, *pointed foreign bodies, parasites* within the anal canal, or *improperly dressed or treated wounds*.

**Funnel-shaped entrance to rectum** has been known to complicate *hypertrophy* of the *levator ani*, which draws the anal structures upward, and congenital defects; but is usually an indication of *passive pederasty*.

**Irritability and Hypertrophy of the Levator Ani Muscle.**—This muscle frequently becomes *thickened, contracted, sensitive*, and interferes with the bowel movements; these changes are secondary to *chronic inflammatory and ulcerative lesions* in the *mucosa, fissure, rectal cancer, blind fistula, stricture*, disease in the *pelvis, bladder, and prostate*.

**Skin-tags** complicate *internal hemorrhoids* and other rectal



affections accompanied by an *irritating discharge*, when not secondary to *thrombotic hemorrhoids*, whence the clot has been absorbed.

**Papillitis and Cryptitis.**—Pointed sensitive papillæ associated with inflamed crypts are indicative of *blind internal fistula*, *fissure*, *stricture*, *cancer* or *ulcerative lesions* in the rectum, that secrete a discharge, which keeps the mucosa *inflamed* and *irritable*.

**Hypertrophic Excrescences—Papillomata.**—Diminutive and larger polypoid-like growths are frequently seen in *tubercular*, *syphilitic*, and other forms of *ulcerative colitis*, or in *intestinal lesions* accompanied by *bathing* of the *mucous membrane* with an *acid* *luetic*, *leukorrheal*, or *gonorrheal* discharge.

**Ballooning of the rectum** is observed in persons suffering from *atonic constipation*, *chronic diarrhea*, *rectal stricture*, *cancer*, and bowel obstructions favoring the *accumulation* of *gas* and *feces* above the block, and when the *rectal musculature* is *atonic* from any cause.

**Fecal Impaction.**—Impacted feces are frequently troublesome in ordinary *constipation*, but are more often a symptom of rectal block where passage of feces through the rectum is interfered with by a *growth*, *stricture*, *diverticulum*, *enlarged prostate*, *foreign body*, *narrow anal canal*, or *hypertrophied levator ani* or *sphincter* muscle. In any case feces may present as *hardened scybalæ* or a *large solid* or *putty-like mass* that fills the rectum.

**Abnormal Sitting or Standing Posture.**—Patients having a diseased or deformed *coccyx* sit in a chair so as to prevent pressure on the coccygeal tip; those afflicted with *sacral* or the *pains* following *prolonged spasmodic contraction* of the *levator ani* or *sphincter* muscle obtain relief by *standing bending forward* and *resting the hands upon the hips*; individuals afflicted with *superficial abscess*, *fissure*, or *inflamed hemorrhoids* sit upon the edge of one buttock to avoid direct pressure upon the involved part.

**Flatulence and Tympanites.**—Discomfort and fulness from *gas accumulation* are noticeable in *gastrogenic* and *enterogenic* lesions, *fermentative* and *putrefactive disturbances*, all types of *catarrhal* and *specific colitis*, *parasitic bowel disease*, *chronic intestinal obstruction*, *rectal stricture*, *hypertrophy* of *Houston's valves* or the *levator ani* or *sphincter* muscle, which lesions delay or prevent free evacuation of gas and feces.

**Digestive Disturbances.**—Impaired digestion is usually a manifestation of all *serious* and many of the *minor affections* of the small intestine, colon, or rectum, owing to *reflex disturbances*, interference with intestinal drainage, toxemia, and abnormal changes in the gastro-intestinal juices.

**Constipation.**—*Costiveness* may express general *sluggishness* of

the *intestinal musculature* the result of *carelessness*, or be caused by *lesions in the anal region* accompanied by *painful defecation* and *delayed movements*; while *rectal constipation* is usually secondary to *hypertrophy of the rectal valves*, *irritability of the sphincter* or *levator ani muscle*, a *tumor* or *stricture* that narrows the bowel caliber, *polyps*, *hemorrhoids*, or *growth* that reclude the anal canal.

*Spastic constipation—enterospasm*—is fairly common and incited by *sigmoidal or colonic lesions*, but is occasionally encountered in the presence of *inflamed areas*, *ulcers*, *fecal impaction*, *foreign bodies*, or anything that *irritates the mucosa* and induces resulting *simultaneous contraction of the circular and longitudinal muscle-fibers* of the rectal wall.

**Diarrhea.**—Frequent loose movements are a constant symptom of *gastro-intestinal disorders*, *inflammatory*, *ulcerative*, and *parasitic affections* of the colon, *recurring fecal impaction*, and *chronic mechanical obstruction*; consequently, this manifestation requires careful study before a diagnosis is based upon it.

**Intestinal toxemia** exists to a greater or less degree in *ulcerative* and *inflammatory diseases* of the *intestine* accompanied by *diarrhea*, because *fluidity of chyme* and *feces* and *broken continuity of the mucosa* favor the *dilution*, *distribution*, and *absorption of toxins* within the bowel. The symptoms and end-results of *copremia*, however, are more frequently in evidence where the patient suffers from *atonic constipation* or *intestinal stasis* induced by an *angulation*, *kink*, *stricture*, *ptosis*, *invagination*, or other type of *chronic intestinal blocking*.

**Sepsis.**—Septic manifestations of rectal disease may be *acute* or *chronic*; the latter being observed in *chronic ulcerative diseases* where there is an *abundance of pus* which readily gains entrance to the blood and lymph-vessels through lesions in the mucosa. Symptoms of acute sepsis are encountered where an *abscess* is forming, a *fistula tract is blocked*, a *wound is improperly drained*, and *active changes* are going on in an infected *diverticulum*.

**Cachexia.**—An *abnormal complexion* marks many chronic ailments of the colon and rectum, viz., *dark splotches* appear in the skin of patients *suffering from chronic constipation* and *absorption*; the complexion is *sallow* in *tubercular subjects*, or a *greenish-yellow hue* in *intestinal cancer*; *anemic* where there are intestinal lesions that bleed freely; and the integument has a *dirty yellow color* where pus is being constantly absorbed, and the skin has a *dark greenish or bluish hue* in *argyria* following the administration of large doses of silver nitrate for diarrhea.

**Loss of Weight.**—There is rarely loss of weight from *hem-*

*orrhoids, fissure, and ordinary fistula*, but individuals afflicted with *cancer emaciate rapidly*, those having intestinal tuberculosis more slowly; while *chronic, inflammatory, and ulcerative diseases* of the rectum cause a gradual loss of weight which *varies with the number, extent, and character of the lesions*.

**Abnormal Pulse and Temperature.**—The pulse and temperature are not greatly disturbed in the more common and less serious anorectal affections, but are *irregular and slightly accelerated* where the bowel is *packed with feces or ulcerated and bathed with a discharge*. A *high temperature and fast thready pulse* indicates *active diverticulitis, rapidly forming abscess, closing of a fistulous opening, acute infection, or an improperly drained wound*; a *low temperature with a rising pulse-rate* indicates a possible gangrenous lesion.

**Headache.**—Pain in the occipital or frontal region frequently complicates *constipation and obstipation with intestinal auto-intoxication*. Headache is often observed where the intestine is extensively inflamed or ulcerated and pus and toxins are being absorbed, or digestion impaired.

## Chapter IV

### Examination and Diagnosis of the Stomach, Small Intestine, Colon, Rectum, Anus, and Buttocks

HAVING elsewhere enumerated and discussed the *manifestations* associated with colonic, sigmoidal, and anorectal affections, methods of examining the patient and technic of diagnosing diseases located in the *colon*, *ileocolic angle*, *rectum*, and *anus* will now receive consideration.

**General Remarks.**—Rectal conditions are easily recognized, and colonic lesions can usually be diagnosed, but disease in neighboring and distant organs directly or indirectly responsible for lower bowel symptoms may be difficult to detect, hence a careful *general* and *local* examination of the sufferer is necessary.

In obscure cases the heart, lungs, gall-bladder, and pancreas should receive careful attention, for disease in these organs is frequently associated with gastro-intestinal ailments.

The nose, mouth, teeth, throat, and ears are inspected for infection, since pus from them sometimes passes downward to involve the stomach or intestine; conditions of the tongue are noted, as it often reflects general luetic or gastro-intestinal abnormalities; attention is paid to the esophagus, which may be strictured, and skin markings are studied to ascertain if they are connected with bowel lesions or manifestations, since dermatologic stigmata are frequently present in tubercular, luetic, and carcinomatous disease of the colon and rectum, and dilatation of the surface and abdominal veins is frequently associated with obstructive heart and liver lesions and hemorrhoids.

Nausea, vomiting, eructations, and indigestion point to upper abdominal disturbance, making it advisable to percuss and palpate the stomach, gall-bladder, kidney, liver, and small intestine, and subject the gastric content and feces to a thorough chemic, macroscopic, and microscopic examination to ascertain if manifestations are due to unbalanced gastric or enteric secretion, parasites, excessive fermentation, etc., or to obstructive or other lesions located in the colon or rectum.

Taking the pulse and temperature help in differentiating between acute infections and chronic disease of the lower bowel, ulcerative colitis, diverticulitis, and abscess, which may accelerate



the pulse-beat and be accompanied by a lower or higher temperature according to absorption or infection.

Examination of the blood and urine is indicated in chronic cases, and taking the patient's blood-pressure is practised as a routine in patients over forty.

It is unsafe in obscure colonic cases to attempt a diagnosis without repeated examinations with the bowel full and empty and following test-meals, for often it is difficult to differentiate between chronic gastro-enteric, colonic, and rectal disease, and the practice of making the diagnosis on the symptomatology alone is fraught with danger.

Card No. 3269 NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL.  
Department of Rectal and Anal Surgery, DR. SAMUEL G. GANT.

Admitted January 22, 1917 Result Cured Discharged February 19, 1917

Name James Montgomery Residence Stallan, Texas Sex Male Age 37

Nationality Irish White Yes Colored No Occupation Merchant Habits Good

Bright's No Cardiac No or Hepatic Disease No Rheumatism No Gout No

Tuberculosis No Syphilis No Gonorrhea No Diabetes No

Cough No Hemoptysis No Loss of flesh Slight Present weight 153

Complications Eczema of Perianal skin

Family History Good

Examination of Feces and Urine Negative

Describe Lesion Protruding, ulcerated hemorrhoid and complete fistula

PAIN { Local Yes { Constant No { Type { Lancing No { Dull Yes { Before No  
Reflected No { Paroxysmal No { Burning Yes { Throbbing No { During Yes  
Kind No { Sharp No { Gnawing No { As regards No { After Yes

PROTRUSIONS { No Yes { Color Purple { Shape round { Consistence Soft  
Painful Yes { Bleed Yes { Strangulated partially { Return Spontaneously No

HEMORRHAGE Yes Profuse Yes Slight No Frequent Yes Venous Yes Arterial No

SPHINCTER irritable Tight Yes Hypertrophied No Passive Yes Destroyed No

DISCHARGES Yes Pus Yes Mucus some Blood Yes Mixed Yes

ANESTHESIA Yes Local Yes General No Spinal No

ADDITIONAL History Painful defecation and rectal discharge of pus and blood

DIAGNOSIS Internal hemorrhoids and complete fistula

PALLIATIVE Treatment For twenty-four hours

OPERATION Yes Local Yes Hemorrhoidectomy and fistulotomy

POST-OPERATIVE Treatment Washing and stimulating of rectal wound and drainage of fistula wound.

Use other side to complete history if necessary.

GANT'S CARD-INDEX HISTORY CHART

Fig. 37.—Card-index history chart employed by the author at the New York Post-Graduate Medical School and Hospital.

**History.**—A lengthy history may be unnecessary, but valuable information is obtained by ascertaining the patient's age, occupation, habits, surroundings, methods of living, previous diseases from which he has suffered, and whether he is nervous, emaciated, cachectic, properly digests his food, is constipated, suffers from nausea, vomiting, eructations, or complains of diarrhea, abdominal pain, gas distention, straining during defecation, or evacuation of mucus, pus, blood, tissue debris, or abnormally formed stools—see accompanying history charts of the author (Figs. 37, 38).

It is better to elicit information by careful questioning rather than to permit the patient to devote considerable time in relating the history in his own way.

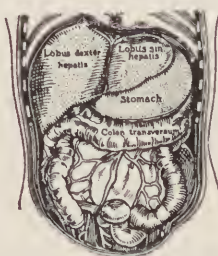
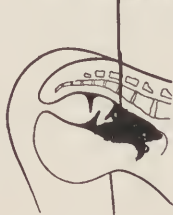
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DATE January-27, 1921.

Name Mrs. James Johnson Single — Married Yes Nativity U.S.  
 City Address 320 Park Avenue Diagnosis Carcinoma Recti located  
 Permanent Address 270 Park Avenue at the recto-sigmoidal juncture  
 Occupation Housewife Referred by Dr. H. C. Fleming  
 535 Park Ave  
 Age 53 Weight { Normal 185 Phone  
 Present 150  
 Lost 35 in 6 months Protrusion No  
 Auto-intoxication Slight  
 Pain { Sharp—dull Yes Pus Yes Straining—Marked  
 Continuous No Blood Yes  
 When Preceding stool Discharges { Mucus Yes Bladder disturbances Yes  
 Pruritus No Cachexia Yes Digestion Poor  
 Constipation and Diarrhoea. Alternating { Normal No Dieting Yes  
 ating { No. Stools daily Variable Incontinence Partial-faecal  
 Color and consistence Variable Tongue Coated  
 Form of stool Irregular

History :—Well until six months ago when she began having slight digestive disturbances, discomfort in the lower abdomen and constipation. Later she suffered from constipation alternating with diarrhea, discharge of mucus tinged with blood, slight straining and feeling as if the bowel did not empty. At time of examination patient's abdomen was distended with gas, fecal accumulations were palpated in the sigmoid flexure and she complained of alternating constipation and diarrhea, bearing down pain, severe straining at stools, profuse discharge of pus, mucus and blood and constant feeling as if there was something in the rectum that could not be expelled.

Carcinoma-recti



Treatment Author's Vaginal Proctectomy With End to End Anastomosis and Preservation of the Sphincter.

Result Patient made an uneventful recovery and there was no sign of recurrence one year later.

Fig. 38.—Page from the author's simplified history book now employed in his office.

The accompanying *diagrams* (Figs. 39, 40), showing the *perianal* and *pelvic regions* divided into quadrants, are useful for recording lesions in the parts for reference at a future time.

**Inspection.**—By general inspection one immediately ascertains if the patient is cyanotic, jaundiced, anemic, pale, cachectic, has a

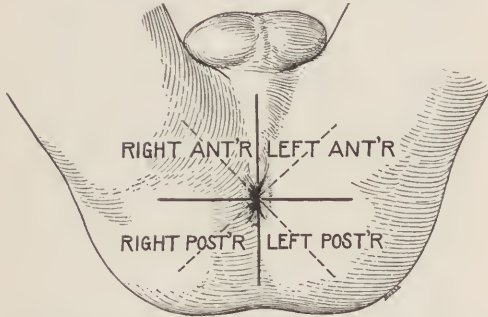


Fig. 39.—Useful plan of isolating the perianal region into definite quadrants for diagnostic, recording, and operative purposes.

healthy color, dyspnea, facial expression of anxiety, is debilitated, emaciated, has flabby muscles, hernia, congestion of surface veins, and if the abdomen is well developed, thin, flabby, or distended or protuberant.

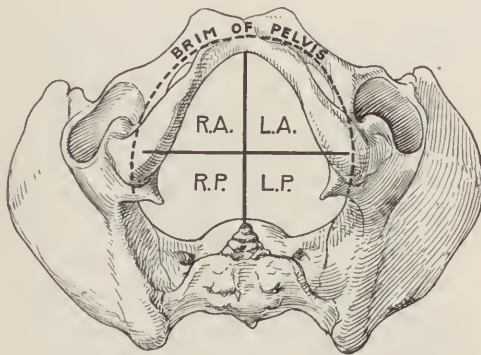


Fig. 40.—Satisfactory plan of dividing the pelvis into right and left anterior and right and left posterior quadrants, useful in charting diagnoses.

In addition, careful inspection enables one to recognize slight hernias, peristaltic waves, and sausage-shaped tumor where the patient suffers from chronic fecal impaction.

Careful examination of the mouth quickly determines if the tongue is coated, the teeth bad, or ulcers or mucous patches are present which would indicate syphilis or other types of infection, and inspection of the nose and pharynx reveals disease if there.

The rectum and sigmoid are *viewed* through the proctosigmoidoscope under direct or reflected light, and ulcers, strictures, cancers,



Fig. 41.—Method of separating the anal margins with thumbs when examining the lower rectum.



Fig. 42.—Bimanual examination as practised in cases of suspected rectosigmoidal or pelvic disease.

polypi, hemorrhoids, and other affections located; *inspection of the perianal region* determines if the patient has skin-tabs, thrombotic



hemorrhoids, fissure in ano, fistula, condylomata, skin polyps, pruritus ani, eczema, tight or patulous anus, external tumor, cyst, abscess, tubercular or luetic lesions, or inflamed skin caused by an irritating rectal discharge (Fig. 41).



Fig. 43.—Method of making superficial abdominal palpation.

**Palpation.**—Valuable information is obtained by simple and *bimanual* (Fig. 42), *superficial* (Fig. 43), and *deep palpation* (Fig. 44) of the abdomen with the patient in different postures and legs extended or flexed. In this way an uneven skin surface, en-



Fig. 44.—Method of making deep abdominal palpation during inspiration and expiration.

larged veins, peristaltic waves, flabby or rigid abdominal wall, tumors, gas collections, neoplasms, foreign bodies, fecal accumulations, displaced kidney (Fig. 45), painful spots and ptotic organs, enlarged liver (Fig. 46) or spleen, hernias, enlarged lymph-nodes, tumors of the uterus or adnexa, and inflamed or enlarged appendix

(Fig. 44) are detected. Used in connection with *inflation*, palpation assists in locating growths, dilated and displaced organs, enterospasm, foreign bodies, and different types of chronic intestinal obstruction.



Fig. 45.—Palpating the right kidney.

Sigmoidal and rectal affections are palpated through the vagina when low or seen through sigmoidoscope or proctoscope when high.

Palpation of the *rectum* and *perianal* region is necessary in proctologic cases, for the educated finger (Fig. 48) readily detects fistulous openings, branch sinuses, indurated and painful areas, em-



Fig. 46.—Satisfactory method of palpating the liver and gall-bladder.

bedded foreign bodies, irritability of the sphincter or levator ani muscles, hypertrophied rectal valves, enlarged anal papillæ, sensitive crypts, tumors, polyps, hemorrhoids, fissures, disease in neighboring organs, deformity of the coccyx, postanal dimples and condylomata, lipomata, and sebaceous cysts near the anus.

*Spinal palpation* in obscure cases sometimes elicits sensitive areas on either side of the vertebral column in stomach and intestinal affections. In gastric ulcers sensitive points are found on the left



Fig. 47.—Method of detecting deep tumors, abscesses, fistula, diverticula, and encysted foreign bodies in the perianal region by index-finger palpation.

side of the tenth, eleventh, and twelfth dorsal vertebræ, while in *cholelithiasis* they are reversed, and in *neurasthenia* the integument of the interscapular and sacral regions is sensitive to touch and musculature adjacent to the spine may or may not be rigid.



Fig. 48.—Method of palpating the sphincter, lower rectum, and perianal region with thumb outside and index-finger in the bowel.

**Auscultation** is useful for determining heart and lung lesions, gurgling sounds, and trickling water or hissing gas, introduced for diagnostic purposes.

**Percussion** enables one to locate inflammatory deposits, pus accumulations, fecal impaction, indurated and sensitive points, gas collections, enlarged and displaced organs, and obstructed points in the colon when employed with gas or air inflation, since it gives a *high* tympanitic in the distended above, and a *low* note in the empty bowel below the block.

**Transillumination** is of little diagnostic value in rectocolonic affections.

**Colonic lavage** helps to demonstrate if the colon is dilated or obstructed, whether the mucosa is ulcerated or inflamed, by washing out mucus, pus, or blood, and whether or not fecal masses habitually accumulate in a certain section of the gut.

**Inflation.**—By inflating the stomach or colon and inspecting, percussing, and palpating the abdomen one differentiates the

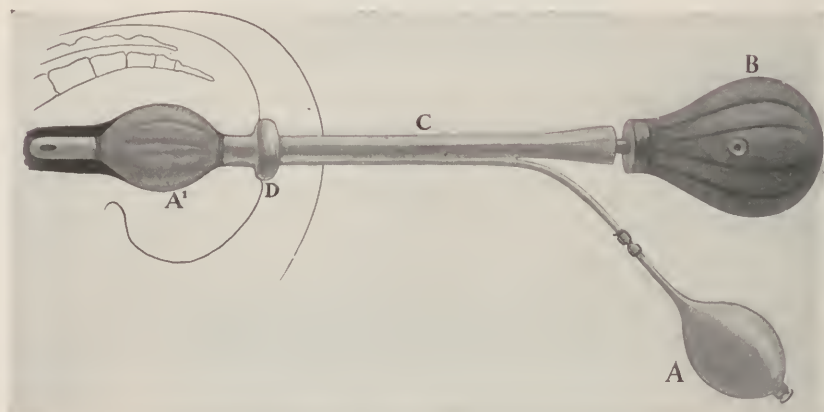


Fig. 49.—Strauss' inflating and irrigating rectal tube.

stomach from the intestine and other organs, defines individual segments of the colon, locates growths, enlarged or ptotic organs, and isolates points in the bowel blocked by adhesions, neoplasms, twists, invagination, stricture, or diverticulitis.

Distention is accomplished with air or gas, and inflation maintained to the desired extent with aid of the Strauss instrument (Fig. 49), and consequent pain is immediately relieved by allowing the distending agent to escape through a proctoscope when examination has been completed.

**Examination of the Stomach Contents.**—Chemic, macroscopic, and microscopie *analysis* and *inspection* of the gastric content following *test-meals* (Fig. 50) are valuable diagnostic aids in obscure gastro-intestinal affections, since, in connection with exam-



ination of feces, they help to differentiate gastric and enteric from colonic and rectal inflammatory and ulcerative lesions, and determine whether the patient suffers from *gastrogenic* or *enterogenic disturbance*, *neurogenic diarrhea*, or loose movements the result of catarrhal or infectious colitis.

**Examination of the Stools.**—Physicians lay too much stress on fecal examination, and do not pay sufficient attention to physical



Fig. 50.—Method of removing stomach contents for examination following test-meal.

diagnostic measures and inspection of the bowel through the sigmoidoscope.

Frequent soft evacuations containing jelly-like mucus indicate catarrhal colitis; diarrhea, where feces include blood, pus, or mucus, alone or admixed, point to tubercular, luetic, amebic, balantidic, or bacillary colitis; when, in addition, the patient complains of weight and fulness in the rectum and constant desire to stool, stricture or malignancy is responsible for the trouble, in which case feces when semisolid are evacuated in ribbon or pipestem-like pieces, though

stools are often normal where the constriction is high and feces collect below it before being evacuated.

*Odor*.—Stools are particularly *offensive* in liver affections, gastro-enteritis, and simple and infectious colitis complicated by extensive ulceration; an *odor* is characteristic of rectal cancer unless the bowel is frequently irrigated.

In obscure cases *macroscopic*, *microscopic*, and *chemic* examination of excreta is required to determine whether or not the patient is suffering from gastric or intestinal disease, catarrhal, membranous, or infectious colitis, parasites, polyposis, hemorrhagic coloproctitis, biliary or pancreatic derangement, excessive alkaline or acid reaction of the feces, abnormal activity of *accidental* or *obligate* micro-organisms, such as the coli, lactis aërogenes, bifidus, aërogenes capsulatus—gas forming—putrificus or Boas-Oppler bacilli, streptococci, etc.

**Examination of Urine.**—Careful examination and analysis of the urine is made in suspected chronic gastro-intestinal affections, for urine is increased by diabetes, amyloidosis, and neurogenic disturbances, and decreased in individuals who are debilitated, have a low blood-pressure, drink little water, or suffer from frequent vomiting, hemorrhage, or chronic diarrhea.

By urinary analysis one ascertains the presence of sugar, albumin, or excessive *indican*, the latter being a usual complication of albuminous putrefaction and colonic stasis with intestinal auto-intoxication.

Ethereal sulphuric acid is increased by albuminoid putrefaction and acute intestinal infection. *Acetone* and diacetic acid when marked and associated with colitis, intestinal obstruction, parasitic diseases, malignancy, diabetes, or peritonitis may be a contraindication to serious operations.

*Acid* urine may be associated with indigestion, auto-intoxication, and neurogenic disturbances; bile pigments and acids point to disease of the liver, bile-ducts, or gastro-duodenitis; and urinary sediments sometimes indicate inflammatory or ulcerative condition of the bowel. A microscopic examination of urine must also be done; cystoscopy, differential urine analysis, and pyelography may be required.

**Examination of Blood.**—Hematology is a valuable adjunct in surgical conditions of the colon and rectum, but examination of the blood in such cases is more useful to determine the result of than to diagnose the local condition. *Cancer* usually causes degeneration of the red blood-corpuscles, but in exceptional and early cases does not; intestinal *tuberculosis* with mixed infection is

complicated by leukocytosis, but in the miliary form polynuclear is low and lymphocyte count is augmented; *colonic sepsis*, *appendicitis*, *diverticulitis*, and other acute *suppurative* and *inflammatory* processes within the abdomen show a leukocytosis with disturbed relation between different forms of leukocytes to a greater or less degree; intestinal parasites—helminths, pathogenic ameba and balantidic coli, trichinosis—cause a decided increase of *eosinophils*.



Fig. 51.—Colonic cancer successfully operated upon. Radiograph by Cole.

In colonic bleeding the blood-picture may show that a transfusion is required before any serious operation is undertaken.

**x-Ray Examination.**—The majority of rectocolonic diseases are accurately diagnosed by obtaining a clear history, analyzing symptoms, inspecting, percussing, and palpating the abdomen, studying feces, and examining the bowel with finger and through the proctoscope or sigmoidoscope; but in obscure cases the small intestine and colon are fluoroscoped and studied through the aid of radiographs (Figs. 51–59) made following the administering of barium test-meals or enemata.



Fig. 52.—Redundant distorted colon.

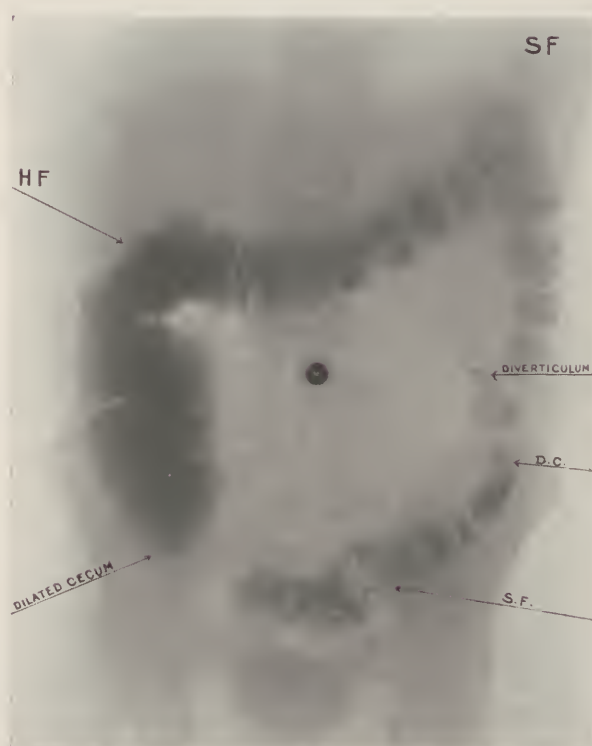


Fig. 53.—Radiograph of diverticulum located in the descending colon.





Fig. 54.—Pyloric stenosis caused by adhesions showing marked ptosis and hypertonicity. The stomach still full fifty hours after barium meal; radiographed at Broad Street Hospital.



Fig. 55.—Same case six weeks following gastro-enterostomy and gastropexy, the patient having gained 12 pounds. Radiograph, taken one hour following ingestion of barium meal, shows elevation and diminution in size of the stomach, and *A*, patency of the posterior gastro-enterostomy opening. (Author's case.)



Fig. 56.—Traumatic diaphragmatic hernia (Truesdale Clinic).

Fluoroscopic examinations are often confusing, and radiographs and stereoradiographs are, even under favorable conditions, difficult to interpret correctly, and diagnoses based on them have fre-

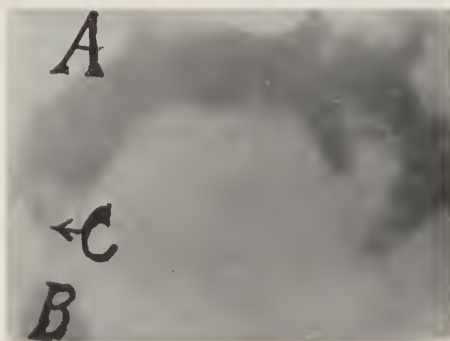


Fig. 57.—Colonic cancer: *A* and *B*, Barium-filled gut above and below growth; *C*, cancer.

quently led to unnecessary or wrong operations; hence the author places little reliance upon *x-ray* examinations except where fluoroscopic inspection and radiographs *confirm* findings based on other and more reliable diagnostic measures.



Fig. 58.—Arrows indicate new growth.

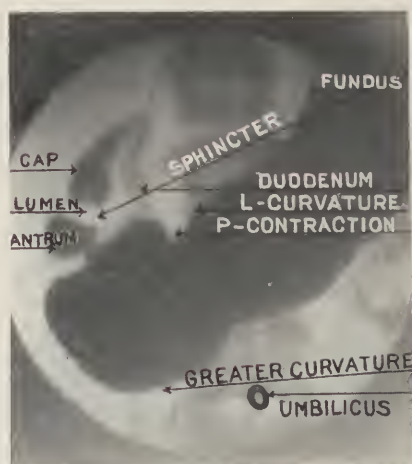


Fig. 59.—Gastric curvatures, sphincter, fundus, and position of duodenum. Radiographed by Cole.

In suitable cases fluoroscopies and stereoradiographs are an aid in locating and diagnosing *esophageal stricture* or *cancer*, *gastric* and *duodenal ulcers* and *cancers*, *pyloric stenosis*, *gall-stones*, *pancreatic*

*calculi*, renal or ureteral calculi, strictured ureter; atony, hyperperistalsis, kinks, strictures, adhesions, tumors, or cancer of the gastro-intestinal tract.

A definite time is required for barium meals to pass from mouth to the anus, and when the opaque substance is shown by fluoroscopic inspection or radiographs to be delayed in a particular segment of small intestine, colon, or rectum longer than normal, an ulcer causing enterospasm, stricture, or growth is suspected, for in such cases passage of bismuth through the diseased bowel may require two or more days or be completely arrested.

The colon and rectum is prepared for fluoroscopic examination and radiographing by administering bismuth oxychlorid or barium sulphate by mouth, in porridge, water, milk, buttermilk, or cocoa, or in a high enema, following emptying of the gastro-intestinal tract with castor oil and colonic irrigation.

The author has found *x-ray* examinations valuable in completing the diagnosis of the following rectocolonic affections: ptosis, invagination, ileocecal valve incompetence, volvulus, kinks—Lane's—malignancy, tumors, polyposis, diverticula, enterospasm, obstruction from foreign bodies, adhesions, fecal impaction, colonic dilatation, extra-intestinal pressure lesions, movable cecum, redundant sigmoid, fecal fistula, neoplastic tuberculosis, extensive ulceration and blocking of the lower bowel by hypertrophied rectal valves, hypertrophied levator ani, or sphincter muscle accompanied by ballooning of the rectum.

**Wassermann and Tuberculin Reaction Tests.**—In confusing cases of rectal neoplasms, strictures, and ulcers involving the rectum or sigmoid flexure the patient is examined for *congenital stigmata* and characteristic manifestations of *acquired syphilis*, a *Wassermann test* made, and, if necessary, antisyphilitic test treatment instituted to determine whether or not lesions are caused by lues.

Rectocolonic tubercular ulcers and tumors are often mistaken for bacillary, luetic, amebic, and balantidic colitis, inflammatory growths or *gummata*, and to clear up the diagnosis in doubtful cases patients may be submitted to a *tuberculin test*, though the procedure is often unreliable, as is the *opsonic index*, for this purpose.

**Examination of the Sigmoid Flexure, Rectum, and Anus.**—Examination of the pelvic colon and rectum must be thorough if mistakes are to be avoided, because in no part of the body is disease so frequently overlooked or incorrectly treated.

**Preparation.**—Digital and proctoscopic examinations are disagreeable and incomplete when fluid or solid feces are encountered;

the former dribble into the proctoscope and the latter block insertion of the finger, speculum, or sigmoidoscope.

In the majority of instances the rectum is empty, and the examination is quickly completed; but when the patient suffers from diarrhea, fluid evacuations must be arrested through the administration of Dover's powder, morphin, or an astringent.

When inspection is rendered difficult by mucus, pus, or blood accumulations the intestine may be quickly cleared by soapsuds enemas or colonic irrigation. In case the bowel is blocked at one or more points by solid feces or scybalæ the result of strictures, cancer, or hypertrophied valves a liberal dose of castor oil, licorice powder, or other active laxative or cathartic, followed by copious enemata, satisfactorily prepares the rectum and sigmoid flexure for examination.



Fig. 60.—Correct Sims' posture for rectal examination.

Usually *small* low injections are preferable to *copious high* enemata, because they clear the rectum without liquefying feces higher up.

*Anesthesia.*—Experienced proctologists seldom employ local or general anesthetics in anorectal examinations, which ordinarily cause but slight or no discomfort when the finger or proctoscope is warmed, lubricated, and slowly introduced, pressure being made opposite sensitive lesions. General narcosis is occasionally desirable for pelvic and rectocolonic affections in nervous or highly sensitive patients that cannot be properly examined otherwise.

When the sphincter is hypertrophied, the anal canal is tight, or there is an extremely sensitive area, pain caused by insertion of the finger, speculum, or proctoscope is avoided by injecting cucain beneath the lesion or into the sphincter muscle, following which the anal canal is quickly divulsed without discomfort.

*Position.*—The left lateral *Sims'* (Fig. 60), *lithotomy* (Fig.



61) posture with hips elevated suffices for perianal inspection, digital and speculum examination of the rectum and anus; but

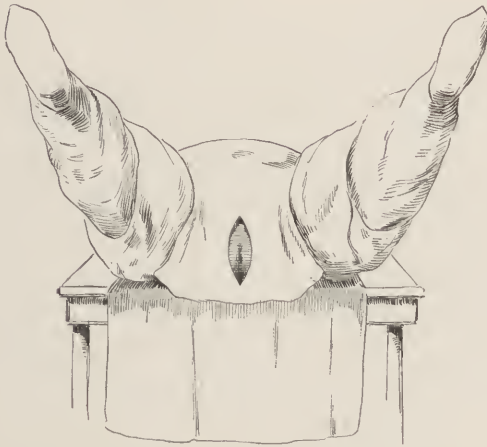


Fig. 61.—Patient properly covered and in the lithotomy position for anorectal work—examination or operation.

when the lower bowel and sigmoid are to be inspected through an ordinary or pneumatic proctoscope, the knee-chest—*genupectoral*



Fig. 62.—Correct genupectoral posture for proctoscopy.

position (Fig. 62) is most satisfactory to physician and patient. When the bowel does not inflate sufficiently to give a clear view,

satisfactory results are always obtained by changing the patient from the knee-chest to the inverted posture (Fig. 65); not so fre-



Fig. 63.—Incorrect genupectoral posture for proctoscopy.



Fig. 64.—Method of detecting rectal cancers, tumors, and invagination of the sigmoid flexure located in the upper rectum by having the patient stand and strain down as the finger is pushed high up the bowel.

quently employed because both men and women object to standing on their head.

No position is satisfactory unless tight corsets have been loosened and underwear displaced, so that they do not interfere with examination or instrumentation. While this is desirable, it is unnecessary to expose the patient to a humiliating degree.



Fig. 65.—Inverted position for proctosigmoidoscopic examination and treatment.

In confusing cases it is advisable to alternate from one position to another, and complete the examination in the *erect posture*, the patient straining against the finger inserted into the rectum (Fig. 64), which enables one to detect a lesion or tumor which



Fig. 66.—Index-finger palpation useful for detecting an inflamed appendix or tender spot in the abdomen.

otherwise could not be reached by digital exploration. The recumbent position with legs flexed (Fig. 61) is the position of choice for abdominal examinations.

*Equipment.*—Briefly summarized, the coloproctologist's office

equipment consists of an attractive reception room, well-lighted operating, treatment, irrigating, resting and toilet rooms, having exits that permit the patient to depart without re-entering the reception room. Suitable tables of proper length and width that can be raised or lowered at either end or tilted in from side to side—Allison's or Hane's (Fig. 67)—are preferable to physicians' examining chairs and sofas, which are not suitable for proctologic work.

An appropriate *light* is important, and nothing excels sunlight for external inspection and examination of the anal canal;



Fig. 67.—Hane's table, with which the patient can be quickly placed in the inverted or other posture for examination or treatment. (Manufactured by W. D. Allison Co.)

but when the rectum or sigmoid are to be illuminated through a speculum or sigmoidoscope artificial light, such as a suitable *head mirror* or reflecting hand light, is necessary unless the instrument is provided with an attached electric bulb.

*Additional Paraphernalia.*—The following instruments are required in a series of examinations of the anus, rectum, and sigmoid flexure: *specula*, *anoscopes* (Figs. 69–72), *proctoscopes*, and *sigmoidoscopes* (Figs. 73–76), *probes* (Fig. 77), *curets*, *dressing forceps*, *rectal bougies*, *anal dilators*, *magnifying glass*, and *fountain syringe* or *irrigating apparatus*.

**Specula.**—Examining specula are seldom employed by the



author, since their introduction is painful and a poor view is obtained, they frequently slip out or pinch the patient, and because, with a proctoscope, one can quickly, thoroughly, and painlessly inspect the entire rectum. The author occasionally employs his large or small examining speculum (Figs. 68, 69) where a polyp, ulcer, fistula, or inflamed crypt, previously located digitally, is

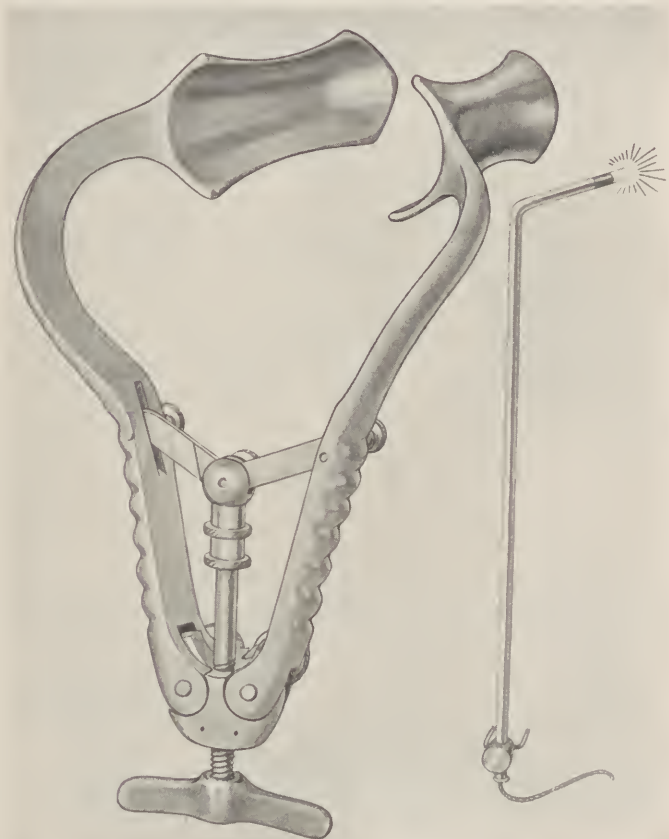


Fig. 68.—Author's large self-retaining examining and operating speculum; this instrument is useful for operative purposes and divulsing of the sphincter or strictures, and can be used with or without electric light.

to be exposed, probed, or anesthetized for examination or operation.

*Anoscopes, Proctoscopes, and Sigmoidoscopes.*—The author's small and large self-retaining *anoscopes* (Figs. 71, 72) having a round or, preferably, tapering end (Fig. 71) are useful for exposing affections located in the anal canal.

The *proctoscope* is employed to detect lesions in the upper or movable rectum, and the *sigmoidoscope* is serviceable for diagnosing disease in the sigmoid flexure.



Fig. 69.—Author's examining speculum, also useful for operations performed under local anesthesia. The instrument can be used with or without electric light attachment.

The busy proctologist requires numerous proctoscopes and sigmoidoscopes from  $\frac{1}{2}$  to 1 inch (1.27 mm.—2.54 cm.) or more in size, varying from 3 to 15 inches (7.62–48.10 cm.) in length, to avoid frequent sterilization and pain incident to the introduction of an instrument that is too large or small.

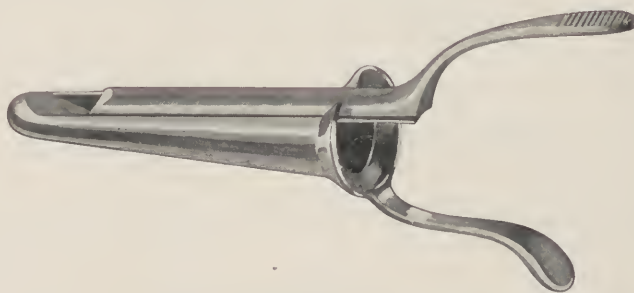


Fig. 70.—Brinkerhoff's slide speculum.

*Simple* tubes of the Kelly type (Fig. 75) with the aid of reflected light suffice in the average case, but pneumatic proctoscopes, Tuttle's or Law's (Figs. 74–76), carrying an electric bulb, are indispensable in the diagnosis of lesions and tumors located in the

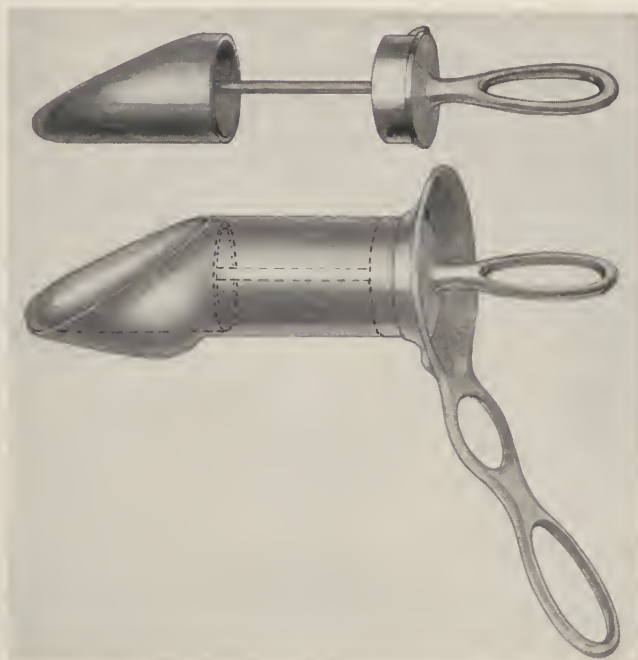


Fig. 71.—Author's small self-retaining examining and operating anoscope having a slanting end that gives a satisfactory view, and can be employed with or without an electric attachment.

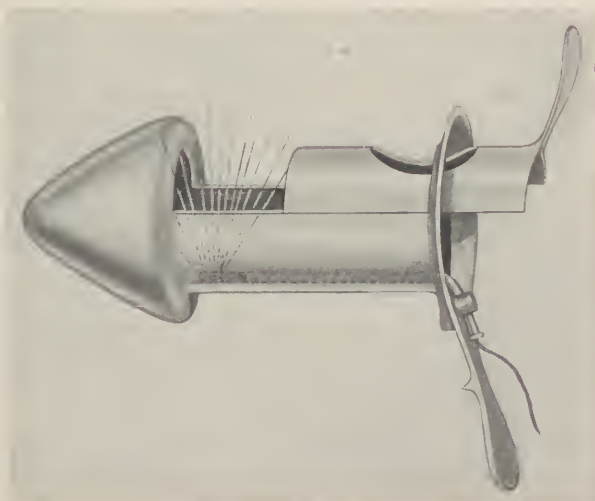


Fig. 72.—Author's large self-retaining examining and operating anoscope. Very useful in local anesthesia work and for examining the anal canal when surrounding muscles are relaxed. Can be used with or without attached light.

sigmoid or rectum that cannot be exposed because the bowel is diseased and fails to inflate under normal air pressure.

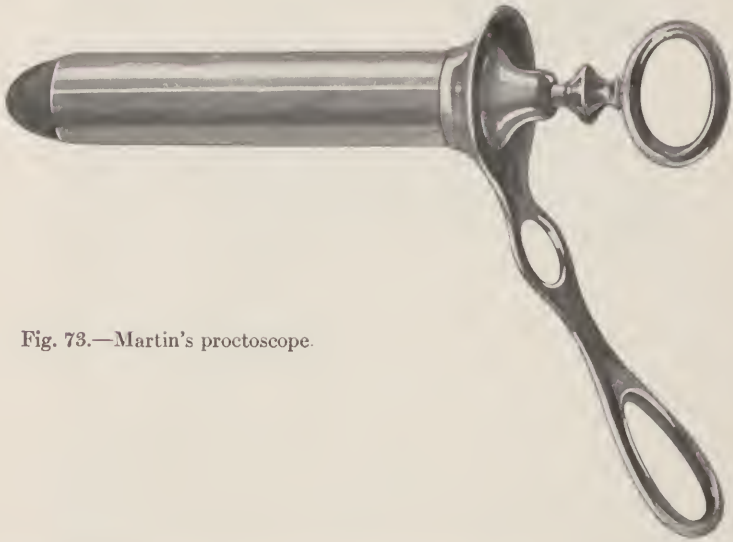


Fig. 73.—Martin's proctoscope.

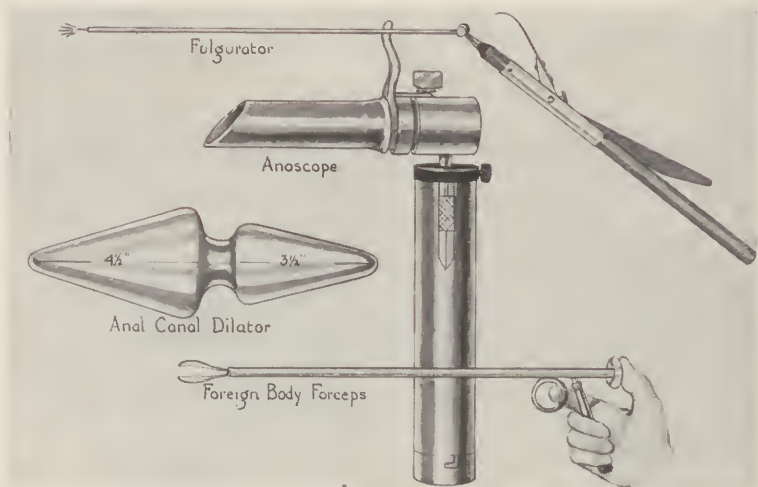


Fig. 74.—Gant's anoscope with handle battery, anal canal dilator, his forceps for the extraction of foreign bodies, and fulgurator employed through the proctoscope in the destruction of polyps and treatment of ulcers by fulguration.

*Probes.*—Rigid and pliable, large and small, long and short, straight, and probes angulated at the end (Fig. 77) are essential for examining the length, size, and direction of fistulæ and pockets.



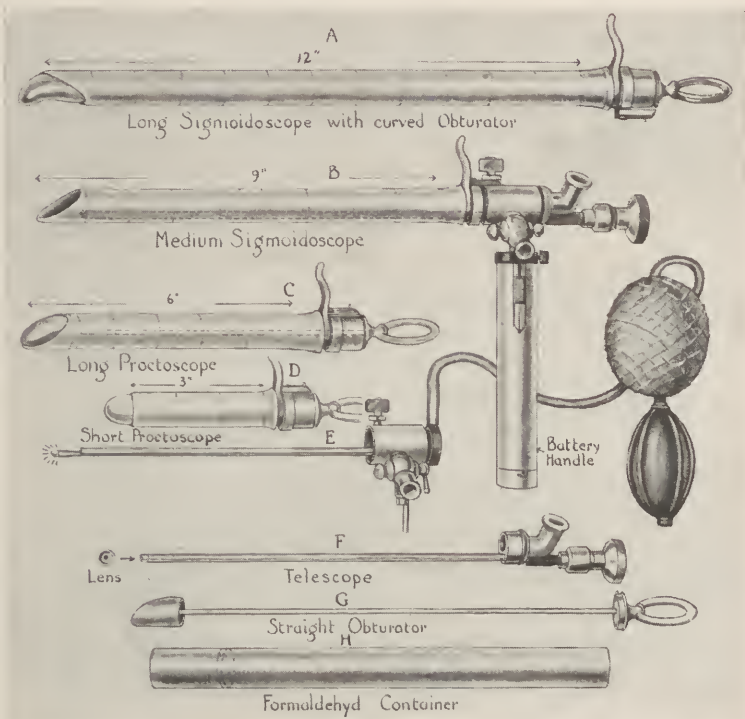


Fig. 75.—Gant's proctosigmoidoscopes.

These instruments, made in different sizes and provided with a wide visioning telescope are practical because: (1) they are easily introduced, (2) may be employed independently or in conjunction with air or water distention, (3) serve as an irrigator for examining and treatment purposes, and (4) are lighted with either a battery handle, portable battery, or rheostat and conducting wires. (Manufactured by the Woppler Electric Co.)

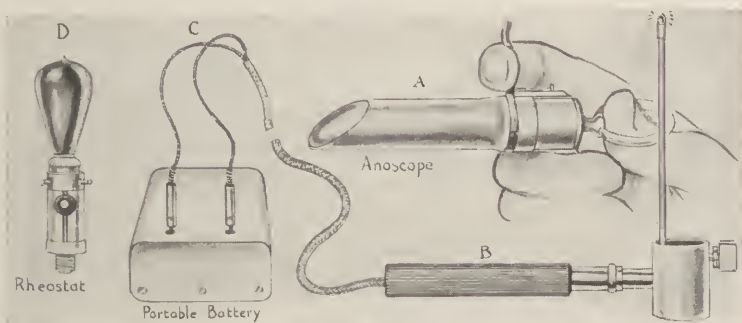


Fig. 76.—Showing A, Method of introducing Gant's anoscope, which can be used (B) with or without battery handle, (C) portable battery and light attachment, and (D) with rheostat and conducting wires.

locating fissures, ulcers, crypts, embedded foreign bodies, and determining the extent of lesions when the mucosa is undermined.

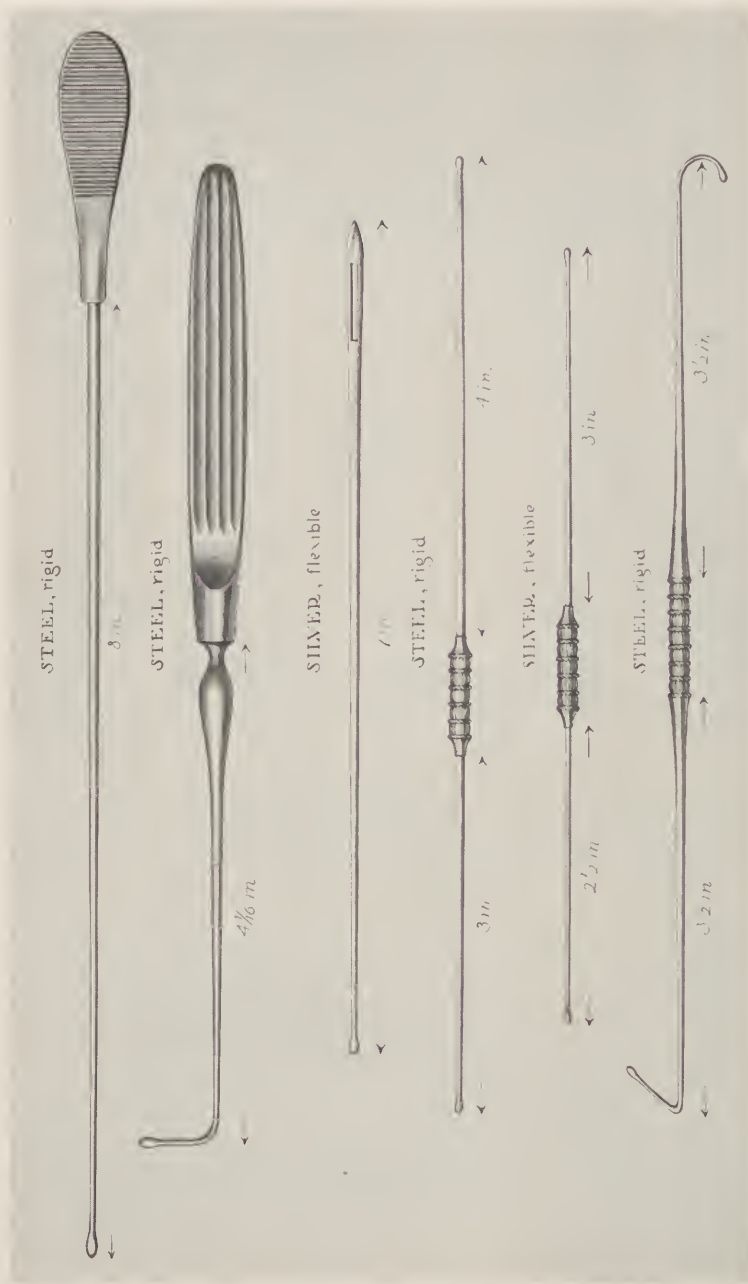


Fig. 77.—Author's complete set of straight and angulated, rigid and flexible probes necessary for examining different types of anorectal fistulae, pockets, fissures, and ulcers.

To meet these requirements the author designed the set shown in the accompanying illustration (Fig. 77).

Usually a 4-inch (10.16 cm.) ordinary will suffice, but when a sinus is long and tortuous, a probe having a firm flat handle (Fig. 77) is preferable, that the examiner may continuously follow the direction of the tract as the instrument is introduced. A fine pliable probe bent at an angle (Fig. 77) or a steel hook (Fig. 77) is useful for locating blind fistulæ, diminutive right-angled pockets, and testing the depth of ulcers and wounds.

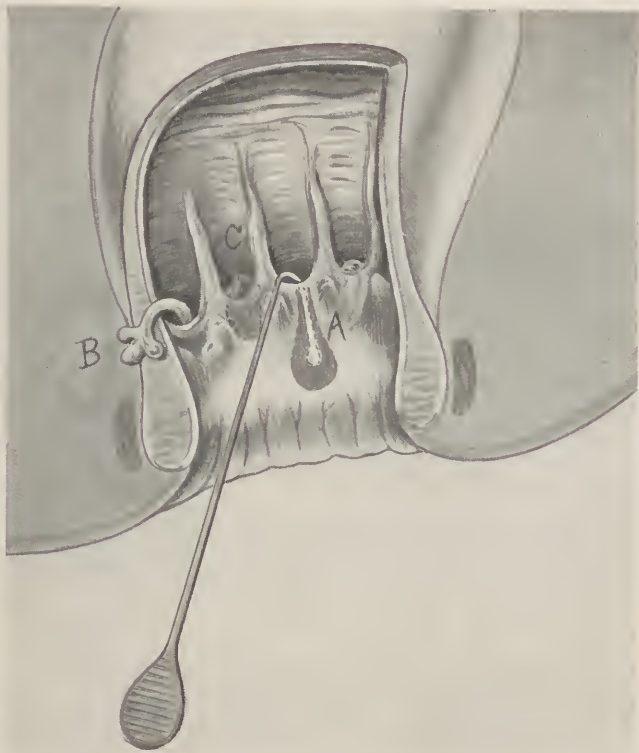


Fig. 78.—*A*, Diagnosing an abscess opening into crypt with hook probe; *B*, polyp; *C*, fecal concretion resting in enlarged crypt.

*Curets*, *spoons*, and *tissue forceps* (Fig. 85) having long handles are needful when pathologic tissue, discharges, or feces are removed through the proctoscope for examination.

*Dressing forceps* several inches in length with handles bent so as not to obstruct the view (Fig. 85) or *long applicators* (Fig. 85) are indispensable; for with them and cotton one can wipe away feces, pus, blood, etc., entering the sigmoidoscope or speculum that obstruct the view.

*Bougies* are seldom employed for purposes of examination since advent of the sigmoidoscope, with which strictures and other obstructions can be more accurately located and inspected. Nevertheless, a proctologist's office equipment is not complete without a set of Wales or other flexible bougies.

Forcible introduction of dilators or bougies is fraught with danger, as several deaths from peritonitis following rupture of the bowel caused in this way have been recorded.

*Anal dilation*, accomplished with fingers (Fig. 79) or dilators, with or without infiltration of the anal canal with eucaïn, has been largely superseded by the anoscope, which serves to divulse the sphincter and permits one to closely inspect the terminal rectum. The Kelly and Young dilators are more often employed to stretch the anal canal than for diagnostic purposes.



Fig. 79.—Divulsion of the sphincter and anal canal with fingers inserted one after the other following anesthetization of the anal canal with eucaïn.

A *magnifying glass* is useful for detecting perianal skin lesions, lice, minute thread-worms, fistulous openings, and excoriations.

A *fountain syringe* or practical *irrigating apparatus* is indispensable, because the administration of a low or high *enema* or rectocolonic *lavage* necessarily precedes digital exploration and proctologic inspection if a satisfactory examination is to be made of patients who have not previously emptied and cleansed the bowel by a cathartic or injection.

*Digital Examination.*—Exploration of the rectum follows inspection and palpation of the perianal region, and is conducted with the patient in the left *Sims'*, *lithotomy*, or *knee-chest* posture, the first being preferable, except when proctoscopic is to immediately follow digital examination, in which case the genupectoral position is generally selected.



Valuable information is obtained with the *educated finger* slowly introduced into the bowel, after it has been warmed, lubricated with vaselin, and soap has been placed beneath the pared nail. Glove and finger cots interfere with sensitive touch and often prevent the detection of erosions, fissures, diminutive foreign bodies, superficial ulcers, inflamed crypts, fistulous sinuses, and openings in and induration of the mucosa; hence they are not employed by the author except to protect himself, where the patient obviously suffers from an infectious discharge or lesion.

The finger is introduced *slowly*, but not with a *boring motion*, upward and forward, to give the sphincter and levator ani muscles an opportunity to relax and permit the examiner to carefully explore the anal canal and lower rectum as the patient gently strains downward (Figs. 80, 81). The novice often fails to make



Fig. 80.—Incorrect method of digitally examining the rectum.



Fig. 81.—Correct method of digitally examining the rectum.

a correct diagnosis because he quickly inserts the finger into the rectum proper, and in so doing causes unnecessary pain and passes the lesion of which the patient complains; hence it is important to remember that the majority of anorectal diseases are located at the anal margin or in the anal canal within reach of the finger.

Digital exploration includes examination of the entire rectum, pelvis (Fig. 83), uterus and adnexa, bladder, prostate, seminal vesicles, sacrum, coccyx, ischiorectal fossæ, and levator ani and sphincter muscles. When lesions are high the free hand is used for manipulation purposes, while the finger is in the rectum (Fig. 42) or vagina.

The coccyx is examined for tumor, fracture, dislocation, or a sensitive segment by seizing it between the finger in the rectum and the thumb placed outside over the bone (Fig. 156).

Tactile examination immediately reveals *fissures, ulcers, indurated, thickened, or sensitive areas, fistulæ, papillomata, polyps,*

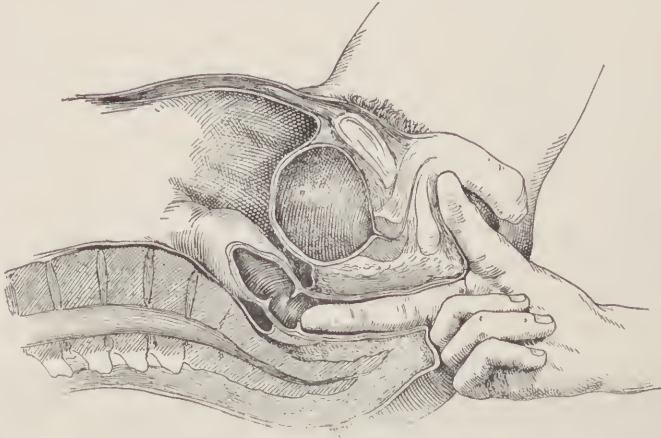


Fig. 82.—Correct method of digitally examining the rectum with the patient in the lithotomy posture.

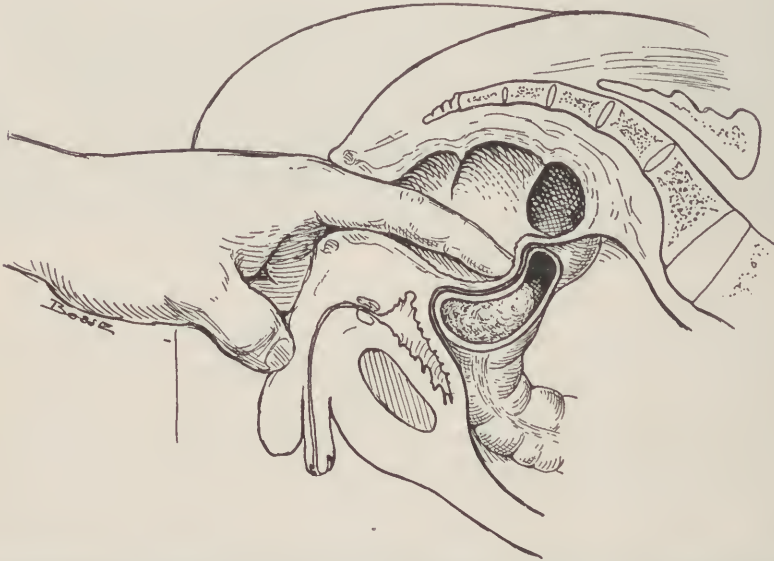


Fig. 83.—Method of digitally detecting tumors and fecal impactions in the sigmoid flexure caused by angulation, stricture, cancer, or hypertrophied O'Beirne's sphincter.

*hypertrophied anal papillæ, inflamed crypts, protruding hemorrhoids, relaxed or spasmodically contracted muscles, foreign bodies, malignant growths, enlarged or displaced uterus, hypertrophy of the pros-*

*tate, thickened vaginal septum, tumor or impacted feces in the lower sigmoid (Fig. 83), and other affections encountered in the ano-rectal region.*

By introducing the finger and pressing strongly upward against the perineum with the rest of the examining hand, while the patient *stands* and *strains* firmly downward, an additional inch or more of the rectum can be explored, and cancer, stricture, or other lesions detected that otherwise would not be reached (Fig. 64).

*Introduction of the hand into the rectum* as recommended by Tuttle and others is impracticable, brutal, and unnecessary since advent of the sigmoidoscope, and should be discarded because a



Fig. 84.—Correct posture for patient and instrument when the long sigmoidoscope is introduced.

diagnosis can be made in other ways, and several deaths have resulted from this method of exploration.

*Exploratory laparotomy* is occasionally justified for diagnostic purposes to enable the examiner to determine the nature and extent of the operation indicated.

*Sigmoidoscopic, Proctoscopic, and Anoscopic Examinations.*—There is no excuse for not correctly diagnosing lesions in the lower sigmoid, rectum, and anal canal when the lower bowel has been carefully examined with the finger and inspected through the sigmoidoscope, proctoscope, or anoscope.

Ordinarily the upper sigmoid flexure is beyond instrumentation, but occasionally it and part of the descending colon can be

inspected through a long sigmoidoscope in emaciated individuals suffering from diarrhea who have a relaxed bowel, and when the gut is examined with the patient straining down the lower colon will often invaginate and bring high lesions or tumor into view.

Proctoscopic is preceded by digital examination, so that the lower rectum may be lubricated and irritable muscles prepared for introduction of the anoscope or proctoscope.

The *knee-chest* (Fig. 62) or *inverted* (Fig. 65) is satisfactory when the Kelly or ordinary tubular instrument is employed, but the left Sims' or *lithotomy position* (Fig. 61) is preferable when a pneumatic sigmoidoscope or anoscope is to be introduced, with or without general anesthesia. *Force* and *overinflation* are to be avoided when inserting a sigmoidoscope, because the former has

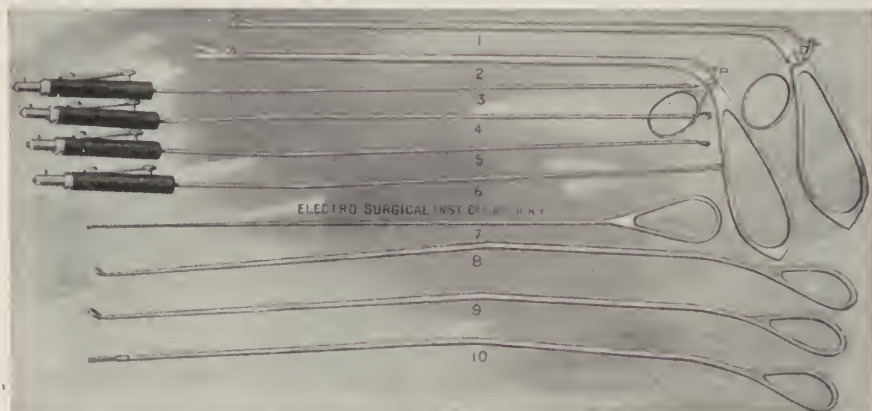


Fig. 85.—Long-handled instruments used through the proctoscope or sigmoidoscope in the diagnosis and treatment of rectosigmoidal diseases.

caused several deaths from rupture and peritonitis where the bowel was angulated, and the latter has induced perforation at the site of an ulcer or stricture.

*Technic.*—Following digital examination the obdurator is inserted, the proctoscope is warmed, lubricated, and pressed momentarily against the anus that the sphincter may become accustomed to it, thus avoiding sphincteric contraction. Next the instrument is pushed slowly downward and forward through the anal canal (Fig. 86) until it enters the ampulla with a *jerk*, which occurs as it passes the levator ani muscle; the tube is now directed upward and backward until the sacral promontory is reached (Fig. 87); finally it is pushed downward and forward, depressing the upper or third rectal valve as the instrument passes



through the rectosigmoidal juncture, and to the left or right into the sigmoid flexure (Fig. 88), which may rest on either side of the pelvic outlet—dextra or sinestra type.

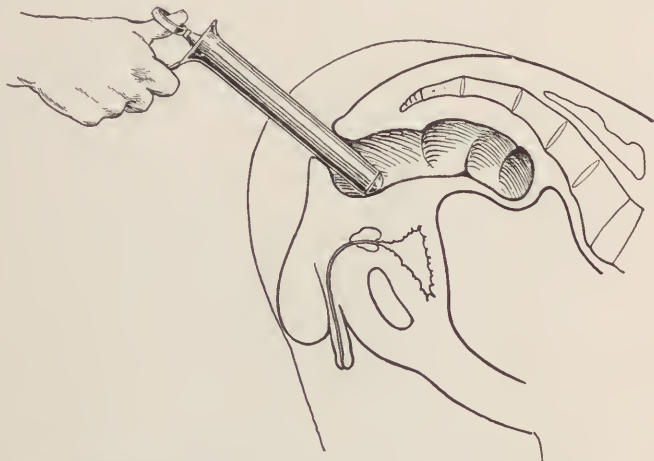


Fig. 86.—Method of introducing the proctoscope: First step.

The obdurator is removed, air permitted to enter and distend the bowel, or when a pneumatic sigmoidoscope is employed, the glass cap is adjusted and the gut is inflated by compressing the

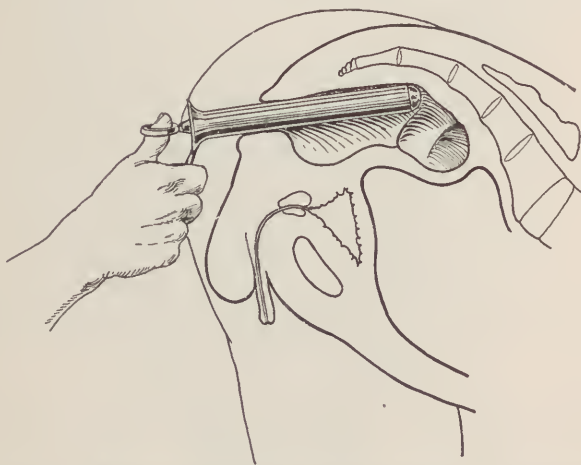


Fig. 87.—Method of introducing the proctoscope: Second step.

attached rubber bulb, following which the sigmoid and rectum are carefully inspected with the aid of reflected light or attached electric lamp as the instrument is slowly withdrawn.

When difficulty is encountered in passing the sigmoidoscope or when the lower bowel is to be inspected first, the obturator is

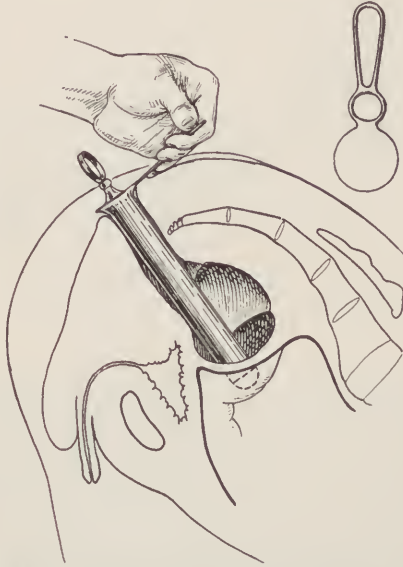


Fig. 88.—Method of introducing the proctoscope: Third step.

repeatedly removed and reintroduced, and the bowel progressively inflated and viewed at different points, so that an angulation,



Fig. 89.—Rectal polyp attached to rectal valve as seen through a proctoscope.

stricture, tumor, or other lesion that might necessitate changing direction of the instrument may be detected; these maneuvers

facilitate introduction of the sigmoidoscope with minimum discomfort and danger to the patient.

Pneumatic instruments are unnecessary when the sphincter is paralyzed, relaxed, or destroyed as the result of an operation, because air escapes at the sides and sufficient inflation can be obtained through an ordinary proctoscope.

An illuminated pneumatic is preferable to an ordinary sigmoidoscope and reflected light when the mucosa is thickened or

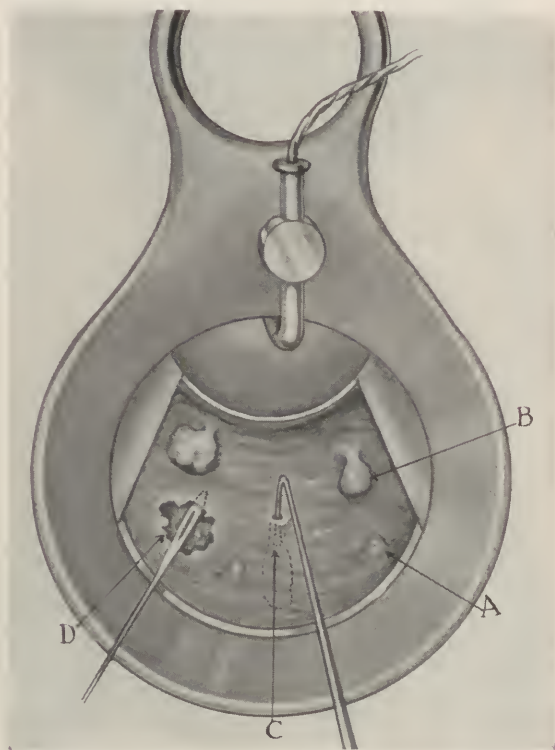


Fig. 90.—Appearance of different lesions located in the anal canal as seen through the author's large self-retaining anoscope (Fig. 72): *A*, Anal papillæ; *B*, polyps; *C*, blind internal fistula; *D*, ulcer with undermined edges.

there is a stricture, cancer, or angulation that interferes with expansion of the bowel by normal atmospheric pressure, because sufficient air can be pumped into the intestine to smooth out the thickened or wrinkled mucosa and straighten the bowel, so the instrument can be passed upward and high lesions inspected.

The anoscope (Figs. 71, 72) is substituted for the proctoscope and speculum when the anal canal is examined because it induces



Fig. 91.—Anoscopic view of the lower rectum at Hilton's white line: *A*, Crypt; *B*, anal papillæ; *C*, fissure caused by laceration of the crypt; *D*, sentinel skin pile.

little discomfort and offers a better view, particularly when it has a tapering end.

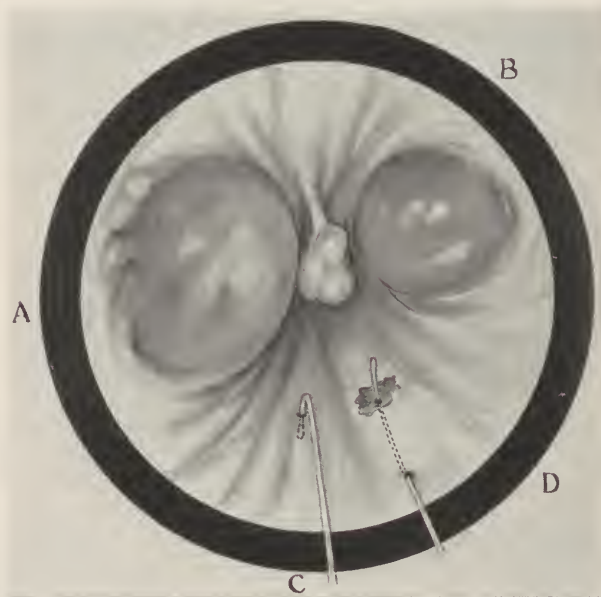


Fig. 92.—Anoscopic view of anal canal showing *A*, hemorrhoids; *B*, polyps; *C*, blind fistula; *D*, ulcer through which a fistula discharges.

With the aid of the sigmoidoscope, proctoscope, and anoscope one can inspect the bowel from the anus to the upper sigmoid





Fig. 93.—Proctoscopic view showing enormous destruction of tissue caused by different types of amebic and mixed infection ulcers as they appear in aggravated amebic proctocolitis.

flexure and accurately diagnose *hypertrophied papillæ*, *hemorrhoids*, *inflamed crypts*, *fissures in ano*, *diminutive and larger ulcers*, *fistu-*



Fig. 94.—Proctoscopic view of the rectal—Houston's—valves: A, Lower; B, middle; C, upper valve retracted with hook to show the rectosigmoidal opening.

*lous openings*, *erosions and thickening of the mucosa*, *foreign bodies*, *thickened rectal valves*, *acute and catarrhal*, *luetie*, *amebic*, *bacillary*,

*tubercular, balantidic, and hemorrhagic colitis, helminths, papillomata, polyps, benign tumors, malignant growths, rectovesical and rectovaginal fistulae, diverticula, procidentia recti, invagination of the sigmoid flexure into the rectum, fecal impaction, stricture, and other affections common to these regions.*

By *inspecting* the bowel in this way one can also ascertain the size and shape of tumors, and the extension, depth, and characteristics of lesions, and *palpate* the bowel with a straight sound or probe for extrarectal growths, indurations, fistulous sinuses, and abscesses.

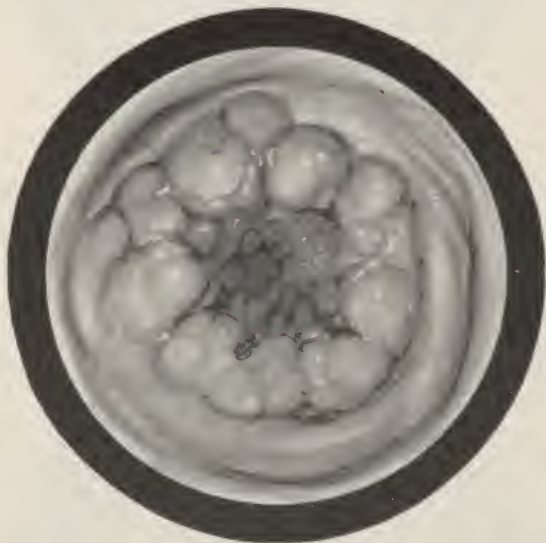


Fig. 95.—Sigmoidoscopic view of an annular carcinoma involving the sigmoid flexure.

To avoid the patient straining against the sharp end of the proctoscope and injuring himself the obturator is reinserted before the instrument is completely withdrawn.

Patients complaining of acute abdominal pain following sigmoidoscopic examination are quickly relieved by placing them in Sims' posture, introducing a small proctoscope, and permitting retained air to escape through it.

**Examination of Other Organs.**—In doubtful cases the *spine, abdomen, pelvis, bladder, prostate, urethra, tubes, uterus, ovaries, and vagina* are carefully examined, for affections in other organs may involve the bowel or disease from the rectum may attack neighboring structures and organs.

## Chapter V

### Coexisting Relations Between Anorectal and Other Diseases

THE frequency with which disturbances in neighboring organs and distant parts are due to anorectal affections and importance of pathologic conditions in the lower bowel induced by *extrarectal causes* is neither understood nor appreciated by the profession, though Graham<sup>1</sup> wrote an excellent chapter on the subject.

Owing to the relations that may exist between anorectal affections and disturbances or disease in other organs or parts, and vice versa, careful examination of the patient from all angles is necessary to insure a correct diagnosis. Hence in doubtful cases the patient's general condition must be taken into consideration; a search made for heart, lung, kidney, hepatic, nerve, focal, orthopedic and endocrin disturbances, and lesions; the gastro-intestinal tract studied with aid of fluoroscope and radiographs, the abdomen percussed and palpated for ptotic and mobile viscera, tumors, gas accumulation, fecal impaction, sensitive areas, deep-seated abscess, displaced or enlarged organs, distortion of intestine—Hirschsprung's disease—megacolon, chronic dilatation, angulation, Lane kink, Jackson membrane, diverticulitis and peridiverticulitis; the urine analyzed, and a blood-count and tests for tuberculosis and lues made. Investigation of the patient is completed by a careful examination of the male and female reproductive organs, genito-urinary tract and anorectal region, including cystoscopy, differential urine analysis, pyelography, proctosigmoidoscopy, and digital examination by vagina and rectum.

**Manifestations and Diseases of the Anorectal Region Induced by Extrarectal Causes.**—*Neurogenic* disturbances or injuries may be evidenced in the colon and rectum, as *constipation, diarrhea, enteralgia, proctospasm, hyperesthesia, membranous coloproctitis, relaxation* of rectal mucosa and musculature, *tenesmus, fecal incontinence*, lack of *rectal and urinary* control, *proctalgia, coccygodynia, hyperesthetic*, acutely sensitive spots, partial or complete *anesthesia, hyperperistalsis, borborygmus*, or *nervous and hysteric* rectum.

Locomotor ataxia is often complicated by bowel disturbances and anorectal crises are characterized by *burning pain*, constant *desire to stool* unrelieved by defecation, *hypersecretion of mucus*,

<sup>1</sup> Cooke, Diseases of the Rectum and Anus.

*relaxation* of bowel tunics, *tenesmus*, *eversion* of anal mucosa, and *fecal*, if not *urinary*, incontinence.

Psychic emotions are frequently accompanied by diarrhea, constipation, or digestive disturbances. Cirrhosis or metastatic carcinoma of the liver, heart lesions, aortic aneurysm, tumors or exudates compressing the large abdominal vessels, accompanied by venous engorgement of the abdominal circulation, are often responsible for *congestion* of the *mucosa*, *rectal varicosities*, *hypertrophy* of the *hemorrhoidal plexus*, and *internal hemorrhoids*. *Arteriosclerosis* and *local atheroma* are predisposing factors in *hemorrhoidal* disease here, and *ulceration*, *fissure*, and *delayed healing* follow anorectal operations.

Chronic *nephritis* with its associated cardiovascular lesions through alterations in circulation and production of high blood-pressure favors *erosions* and *ulcers* in the rectum; *diabetes* may be complicated by independent sloughing of the bowel secondary to the removal of hemorrhoids or division of fistulæ, and even acidosis and death in coma from trifling operative insult.

*Genito-urinary disease* frequently involves or induces anorectal manifestations. Cancers, tumors, and inflammations of the bladder, prostate, seminal vesicles, or urethra sometimes encroach upon the bowel by continuity or by way of the lymph- or blood-vessels, causing *constipation*, *pain* reflexly or through pressure upon nerves, and *ulceration*, *abscess*, or *fistula* when the growth breaks down or the inflammation advances far enough.

*Prostatic enlargement*, *congestion*, or *suppuration* frequently manifests itself in the anorectal region as *proctitis*, with *burning pain*, *obstipation*, *tenesmus*, *sphincteralgia*, *perianal abscess* or *fissure*, and *prostatic massage* frequently causes *inflammation*, *excoriation*, or *ulceration* of the *rectal mucosa*, sometimes terminating in superficial or deep *abscess* and *fistula*. Urethral strictures may be the cause of lower bowel disturbances through straining, instrumentation, or injuries to the rectum made during operation.

*Venereal diseases* contracted by way of penis or vagina through extension of infection, secondary manifestations or irritating discharge, often induce lesions of different types in the rectum, at the anal margin and upon the buttocks—*excoriations*, *fissures* and *ulcers*, *gonorrhea*, *condylomata*, *chancer*, *chancroids*, *mucous patches*, and *congenital luetic anorectal ulceration*.

Disease of the female reproductive organs is a common extra-rectal cause of lower bowel symptoms or lesions. Pregnancy frequently causes vulvorectal varices, hemorrhoids, and pruritus. *Malignancy* of the ovaries, tubes, uterus, or vagina often attacks



or causes pain, obstruction, inflammation, ulceration, or fistulæ in the rectum, and *displacement, enlargement, tumor or inflammation* of these organs may induce *obstipation* by constricting or obstructing the gut, and the venous congestion induces hemorrhoids, and rectal *discomfort* with *excoriation* or *ulceration* is occasionally caused by improperly adjusted *pessaries* which erode the vagina. Acute salpingitis or pyosalpinx (especially left) will give considerable pain on defecation.

Sometimes tubo-ovarian abscess, pyosalpinx, infected ovarian cysts, or sloughing fibroids ulcerate through rectal wall and discharge through anus.

Occasionally the sigmoid, rectum, or sphincter is injured (complete tear) during childbirth, vaginal, uterine, or adnexal operations, or become involved through extension of inflammatory or suppurative processes from surrounding structures resulting in *uterorectal* or *rectovaginal* fistula.

Pott's and hip-joint disease, injury to pelvic bones, sacro-coccygeal necrosis, abdominal and pelvic abscesses sometimes cause pelvirectal, perirectal, and perianal abscess and fistulæ, and sinuses here are occasionally secondary to *ovarian* or *sacral*, degenerating *dermoid cysts* and *tumors*.

*Angulation, ptosis, volvulus, invagination, Jackson's membrane, pericolitis* and *sigmoiditis, chronic fecal impaction, tumors* or *foreign bodies* that constrict or occlude the small intestine, colon, or sigmoid flexure distort the rectum by increasing intra-abdominal pressure, compressing pelvic organs downward, which results in *pain* and *congestion* of the lower bowel through interference with nerves and vessels.

*Appendical infections* are occasionally responsible for acute or chronic coloproctitis. *Diverticula* of the sigmoid flexure when not acutely inflamed usually induce constipation, rectal *pain*, and *sensation of weight* or *proctitis* when the pouch continuously evacuates pus through the lower bowel.

*Catarrhal* and *specific enterocolitis* is usually accompanied by erosions, ulcers, or polyps in the rectum that induce burning *pain* and constant *desire to stool*, with, maybe, bloody diarrhea.

*Disease or displacement* of the *sacro-iliac bones* or *joints* produce *pains* in the pelvis, bowel, back, and down the legs simulating those caused by tumors, ulcers, and fissures of the anorectal region—symptoms frequently confused with *sciatica* and *back-ache* from other causes.

*Suppurative* or infectious diseases of the eye, mouth, nose, throat, and upper gastro-intestinal tract if neglected may termi-

nate in *sigmoiditis* or *proctitis* with excoriations, ulcers, or, rarely, abscess and fistula.

Affections of the stomach, small intestine, colon, uterus, vagina, or vulva, accompanied by acrid discharge, are often responsible for perianal *erosions*, skin lesions, and pruritus.

**Disturbance and Disease in Other Regions Caused by Anorectal Affections.**—Bearing the above in mind, and reversing the process of reasoning, it is easy to understand how rectal affections make themselves felt in adjacent and distant parts. The colon and rectum may be the seat of *focal infection* that may terminate in *endocarditis*, *arthritis*—gout, rheumatism—*anemia*, localized or general *sepsis*, *embolism*, *pneumonia*, or other affection.

Symptoms arising from *tumors*, *hemorrhoids*, *fissures*, and other local lesions are frequently encountered in the pelvis, bladder, urethra, back or down the limbs, being incorrectly attributed to disease of these regions. Benign and malignant *neoplasms* may encroach through enlargement or ulceration upon the male or female reproductive organs, sacral nerves, or coccygeal tip, causing slight or agonizing *pain*, *disturbed menses*, *spermatorrhea*, *nightly emissions*, *frequent micturition*, or *urinary retention*.

*Tuberculosis*, *lentic lesions*, and perianal *epitheliomata* occasionally extend to adjacent structures or more remote organs, causing slight or considerable damage.

*Infection* originating in inflamed or ulcerated mucosa or submucosa may terminate in *sloughing* of the rectovaginal septum or formation of single or multiple abscesses and fistulæ located in the perirectal, pelvic, or abdominal regions, or scattered over the body, that end in ordinary, and in rare instances rectovesical, rectovaginal, or recto-urethral *fistula* are caused in this way.

Complete rectal *procidentia*, through compression and pulling upon adjacent structures, nerves, and vessels, is sometimes responsible for widely distributed pains and digestive disturbances.

*Hemorrhoids* frequently induce *discomfort* in the pelvis, bladder, prostatic urethra, and sacrococcygeal regions, and Tuttle has reported 50 cases of uterine symptoms cured by hemorrhoid-ectomy.

**Treatment.**—The treatment of anorectal affections responsible for disturbances in neighboring and distant organs and anorectal manifestations arising from other diseases has been outlined in separate chapters devoted to these subjects, but for the methods of handling disease in neighboring organs or elsewhere responsible for rectal symptoms the reader is referred to works devoted to general medicine, surgery, and the various specialties.

## Chapter VI

### Anesthesia

GENERAL, SPINAL, PARAVERTEBRAL, SACRAL, EXTRADURAL, CAUDAL,  
REGIONAL, LOCAL INFILTRATION

ANORECTAL LOCAL ANESTHESIA OPERATIONS—ABDOMINAL LOCAL ANESTHESIA OPERATIONS

COMPLETE desensitization of the bowel and other structures coming within the operative field is essential to a good technic when dealing with the rectum or colon. Surgeons no longer allow family physicians to anesthetize their patients, but insist upon having an experienced anesthetist.

In properly selected cases *general*, *spinal*, and *local* anesthesia are reliable, but the method of anesthetization selected must be safe, thorough, and produce minimum postoperative complications.

**General Anesthesia.**—This plan of rendering operations painless is not employed so frequently since surgeons developed the technic of *spinal* and *local*, which in many instances are superior to *general* anesthesia.

*Chloroform*, extensively used in the West and South, is five times more primarily dangerous than ether, and is contraindicated in abdominal, intestinal, colonic, and anorectal work except where spinal or local anesthesia are not applicable, *e. g.*, the patient is very old or young, suffers from pulmonary, renal, or endo-arterial lesions, obstruction, tracheal, esophageal, or laryngeal lesions.

*Ether* or, preferably, *N<sub>2</sub>O-ether* expertly administered by the open or closed method, especially when combined with preliminary hypodermic narcosis, is preferable for tedious intestinal operations except when the patient suffers from renal or pulmonary conditions which may be seriously aggravated by ether.

*Gas-oxygen* anesthesia is suitable for operations requiring a medium length of time, but is unsatisfactory except when administered by a specialist. The method is attractive because the patient succumbs without a struggle, regains consciousness by the time dressings are applied, the method has a low mortality, and seldom causes postoperative sequelæ. Gas-oxygen anesthesia is objectionable for anorectal work because it materially augments bleeding and the anorectal reflexes are hard to abolish.



*Ethyl chlorid* has been tried and abandoned by the author because anesthesia is often incomplete, there are many contraindications and complications, mortality is high, and it is unsuitable for prolonged operations.

*Nitrous oxid* is an excellent anesthetic, for it is rapid in action, the patient quickly recovers consciousness, and it causes scarcely any uncomfortable sensations, complications, or postanesthetic vomiting, and does not aggravate nephritic or pulmonary lesions.

Nitrous oxid is contraindicated in plethoric and alcoholic individuals and patients afflicted with serious heart or arterial disease, obstruction in the respiratory tract, and enlarged lymph-nodes. This anesthetic is very satisfactory for *short*—one- to five-minute—anorectal operations, such as stabbing an abscess, incising a fissure, excising an inflamed crypt, removing hypertrophied papillæ, laying open superficial fistulæ, divulsing the sphincter, breaking up impacted fecal masses, and removing foreign bodies, but is not suitable for *prolonged* operations or where complete relaxation is required.

Laughing-gas is objectionable in certain rectal work because it is accompanied by straining and cyanosis of the tissues, which confuse the operator.

The author has performed celiotomy, appendicostomy, cecostomy, and colostomy under  $N_2O$  or  $N_2O$ -oxygen anesthesia, but prefers gas-ether for these operations and intestinal resection because of the difficulty in keeping the patient unconscious, relaxed with abolished reflexes, and from forcing the bowel through the abdominal incision.

*General* anesthesia is the choice for *abdominal* operations involving the intestine and colon and majors upon the *rectum*, such as extirpation or resection, and for coccygeal excision, deep burrowing abscesses, complex rectovesical, urethral, and vaginal fistulæ, high-lying strictures, congenital malformations, removal of deeply embedded foreign bodies, correction of third degree prolapse, necrosis of the sacrum, Whitehead's operation, and other procedures requiring extensive or an unknown amount of cutting or stitching.

On the other hand, general anesthesia is not necessary for minor surgery of the rectum, which applies to about 80 per cent. of rectal affections. Chloroform and ether are inferior to *infiltration anesthesia* because they are dangerous unless carefully administered by a specialist, render the patient unconscious, which he dreads, prohibits him rendering aid by straining, cause post-operative nausea, vomiting, and straining, which favor hemorrhage,



often aggravate heart, kidney, liver, and pulmonary lesions, and necessitate the sufferer remaining longer in a hospital.

Annoying and dangerous *hemorrhages* occur ten times more frequently following *general* than *local* anesthesia, owing to the patient's pulling off the dressings, throwing himself about and straining while semiconscious, or vomiting. Usually it is wise to employ preliminary hyponarcosis consisting of some one or a combination of morphin, atropin, and scopolamin.

**Rectocolonic—Oil-ether—Anesthesia.**—Since Gwathmey introduced colonic oil-ether anesthesia the method has been employed hundreds of times with varying success, alone or in combination with chlorotone, which tends to soothe the rectum.

Rectal anesthesia is effective and safe when properly administered, and possesses several advantages over other methods for operations other than intestinal; it is not desirable for rectocolonic surgery because the anesthetist gets in the way should further anesthetization be required, odor of ether is offensive to the operator, oil gets on his fingers and instruments, which impedes his work, and the anesthetic irritates the rectal mucosa.

Three times the author has been called to divulse a spasmodically contracted sphincter or incise an irritable levator ani muscle the result of and shortly following rectocolonic anesthetization, and has treated other patients for proctitis, fissure, constipation, and diarrhea caused by the injection of oil-ether into the bowel. The technic of the procedure has been omitted, since this method of anesthetizing patients is impracticable for rectocolonic operations.

**Spinal Anesthesia.**—To Corning belongs the credit of originating cocain intraspinal anesthesia. Spinal anesthesia gained favor, and during the past decade thousands of operations have been painlessly performed after the parts had been desensitized in this manner. Analgesia produced in this way has been successfully employed for upper and lower abdominal, pelvic, vaginal, perineal, and rectal surgery; the anorectal region responds more favorably to spinal anesthesia than the higher areas.

B. F. Alden published 428 cases of *anorectal* affections successfully operated on under spinal anesthesia, including 186 hemorrhoids, 161 fistulæ, 59 ischiorectal abscesses, 5 dermoid cysts, and 6 rectal cancer operations. Dr. W. H. Kiger, of Los Angeles, has also published important statistics emphasizing the value of spinal anesthesia in anorectal work.

The author has successfully performed many anorectal operations under spinal analgesia, and occasionally employs it in suitable cases. Anesthesia thus induced causes complete relaxation

of the pelvic musculature—the levator and sphincter muscles—anesthetizes the perianal skin, and enables the operator to open the rectum and easily explore, which is followed by the delivery of hemorrhoids, polyps, malignant tumors, enlarged papillæ, etc., upon slight traction.

Spinal analgesia is slightly or no more dangerous than ether or chloroform when the injection is made under aseptic conditions, in proper dosage, by an experienced hand, but is fraught with considerable danger when made by an ignorant or careless physician.

The dread of causing death or paralysis has kept many surgeons from employing spinal anesthesia, and in consequence the procedure has not attained great popularity. Desensitization is more complete and lasts longer when anesthesia is preceded by the administration of bromids, morphin, or scopolamin.

Danger from spinal analgesia is greater for upper than lower abdominal and rectal operations, and when the patient is not subsequently kept in a proper position. Operations lasting from twenty minutes to an hour and a half have been performed, but, as a rule, desensitization begins to diminish after forty-five minutes, consequently, general is preferable to spinal anesthesia for operations requiring from one to two hours.

Anesthesia is unsatisfactory when the needle does not enter the canal, dosage is insufficient, the solution is improperly prepared, and when the patient has an idiosyncrasy to spinal analgesia. Complications are rare, but death, paralysis, difficult respirations, occipital headache, vertigo, backache, respiratory disturbances, nausea, neuritis, vesical and rectal incontinence, and acetoneuria have accompanied or followed spinal anesthesia.

Death is caused by paralysis of the medullary respiratory center from rapid dissemination of the anesthetic. Headache, encountered in 7 per cent. of cases, may continue for weeks, but other sequelæ usually disappear within a few hours to a fortnight. Postoperative complications are relieved by the administration of strychnin and the removal of spinal fluid—10 to 25 c.c.

The chief objection to the procedure is that the operator is committed to the dose, whether it acts well or unfavorably.

The *advantages* of spinal anesthesia, briefly summarized, are: it is effective and applicable in cases where local and inhalation anesthesia are unsuitable or objectionable, is not very dangerous, the patient remains conscious and is not troubled with post-operative shock, nausea, vomiting, straining, bronchial irritation, nephritis, or gastro-intestinal irritability.

The paraphernalia required for spinal anesthesia are: glass or metal syringe and strong needles of different lengths, with or without stilet; the author uses *gold* flexible needles, designed by B. F. Alden, which are superior to *steel*, which corrode and sometimes break under pressure.

Different *anesthetic agents* have been used for spinal anesthesia, of which cocain, tropococain, novocain, stovain, and eucain have proved most effective. The author prefers tropococain, novocain, or stovain, and uses a grain of either in crystals, or a diffusible solution put up in sealed tubes which are sterilized and tested prior to each injection. A smaller dosage is required for children, the aged, and enfeebled individuals.

*Technic.*—After the skin at the puncture site has been cleansed with alcohol, dried, and painted with iodine it is surrounded with sterilized gauze, a towel, or rubber tissue sheet. The patient is placed upon the table with head and shoulders bent forward to curve the spine and make the dorsal and lumbar vertebræ more prominent (Fig. 96).

Find the third lumbar interspace between the third and fourth spinous processes, or above or below this point in accordance with the structures to be anesthetized. The skin is sprayed with ethyl chlorid, or it and the deeper structures are infiltrated with eucain to make the process painless.

Having relocated the interspace with the index-finger, the needle is introduced  $\frac{1}{4}$  inch (6.35 mm.) to the right of the median line and directed inward, upward, and forward (Fig. 96) from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches (3.81–6.35 cm.), according to the thickness of the tissues, until the subarachnoid space has been reached, which is indicated by resistance, and then a click as the needle jumps through the ligament.

If cerebrospinal fluid flows through the needle following removal of the thumb or stilet—which indicates a successful puncture—the syringe is connected with the needle and the anesthetizing solution is slowly injected.

When analgesic crystals are employed the piston is worked up and down two or three times to dissolve them in the spinal fluid and all of the anesthetic is injected. Labat, using novocain, employs 0.10 gm. for each 15 pounds of body weight.

After the needle has been removed with a quick jerk and the puncture sealed with collodion the patient is placed upon his back with head lowered or raised—according to specific gravity of injection—so the solution may gravitate the desired distance in either direction.

Analgesia is not satisfactory in the presence of a so-called *dry canal* and when the needle is blocked or penetrates bone, making reintroduction of the needle or the administration of another form of anesthesia necessary.



Fig. 96.—Technic employed in producing spinal anesthesia for anorectal, vesical, and prostatic operations.

**Paravertebral and Sacral Anesthesia.**—Paravertebral anesthesia is produced by injecting and blocking the desired nerve at its exit from the intervertebral foramen (Fig. 97). This form of anesthesia is still in the experimental stage, but enough abdominal, pelvic, perineal, rectal, and other operations have been performed to prove it effective in competent hands. Desensitization



is more difficult to obtain, not so complete, and in extensive operations requires reinforcing with gas-ether more frequently than spinal anesthesia, and toxic manifestations are more troublesome. Hence the author prefers spinal to intervertebral anesthesia for surgery of the anorectal region.

**Sacral—Extradural, Caudal—Anesthesia.**—Sacral is not so dangerous as spinal anesthesia, nor is it so frequently followed by annoying manifestations—headache, vomiting, and backache. High and low extradural anesthesia is accomplished quicker and is more effective when the patient is previously placed in a quiescent state with veronal or combination of scopolamin, morphin, or pantopon,



Fig. 97.—Direction taken by needles in paravertebral transsacral anesthesia.

agents that minimize apprehension and suffering incident to needle pain when the anesthetic is injected. In normal individuals the spinal is isolated from the sacral canal, and there is little danger of injury to the former in producing caudal anesthesia except when it is ignorantly or carelessly made.

Entrance to the sacral canal is easy in some and difficult to make in other instances. Lynch has usually succeeded in locating it at the converging point of lines drawn from the posterior spines of the iliac to the margins of the left and right sacrococcygeal joints, and says the sacral spine is bifid in most instances, which makes introduction of the needle easy.

Except in fat individuals the opening into the sacral canal is isolated by palpating the bone just above the discontinuation of the spinous processes and region of the sacrococcygeal articulation near which the aperture is located.

The *technic* of sacral anesthesia is comparatively simple and the process requires the same aseptic precautions and paraphernalia as are employed for spinal anesthesia, except a longer needle is used to penetrate overlying dense tissues and the lengthy canal.

Pain incident to introduction of the needle is eliminated by infiltrating the tissues with eucain  $\frac{1}{8}$  per cent. before the puncture or preliminary incision to insertion of the needle is made. Follow-

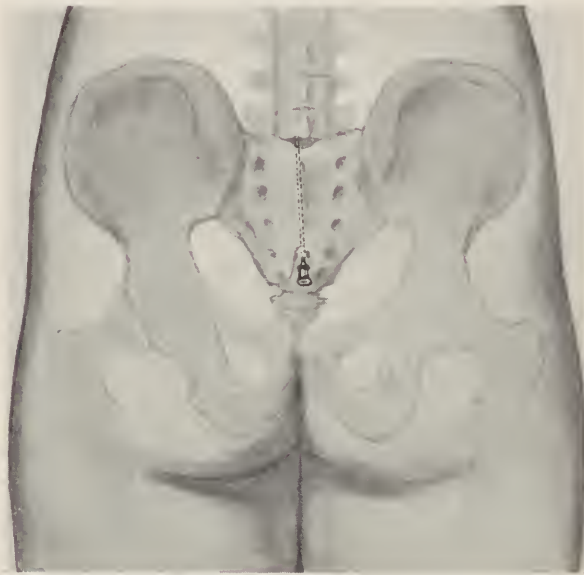


Fig. 98.—Direction taken by needle in sacral anesthesia.

ing anesthetization of outer structures, and placing of the patient in the left Sims' or exaggerated knee-chest posture, the needle is forced through the *hiatus canalis* or triangular space at the fork of the spinous processes above the anal sulcus, which gives an elastic touch when pressed upon with the finger.

As soon as the sacral canal is entered the needle is carried upward and along the bone to the desired distance, following which it is diverted from one direction to another until the operator is certain the point is in the sacral canal (Fig. 98), being careful to avoid injuring adjacent veins. The operation is completed by injecting the solution, withdrawing the needle and sealing the

puncture with collodion, and placing the patient in the position to be retained during the operation.

Eucaïn, novocain, tropococain, or cocain dissolved in distilled water, normal saline solution, or bicarbonate of soda, properly administered, produce effective caudal anesthesia; adrenalin 1 : 1000 is sometimes added to lengthen analgesia and make the vessels contract. Eucaïn  $\frac{1}{2}$  per cent. is satisfactory and less toxic than novocain employed in the Freiburg Frauenklinik. The dosage is varied according to the weight, being less for children, the aged, and in individuals suffering from cachexia, icterus, or drug habitua-



Fig. 99.—Direction taken by needles in presacral anesthesia.

tion. The amount of anesthetic required for sacral is about one-sixth of that employed for spinal anesthesia.

Paravertebral and sacral anesthesia do not produce as complete analgesia and muscular relaxation as spinal anesthesia, hence the author prefers the latter in cases where for any reason local or general anesthesia are contraindicated.

Transsacral induce anesthesia more quickly than caudal injections and analgesia lasts from two to three hours.

Labat, who employs 30 c.c. of a 2 per cent. solution of novocain containing adrenalin 1 : 1000 for the purpose, maintains that caudal anesthesia is less rapid—thirty to forty minutes—than other nerve-blocking anesthetics.

**Presacral Anesthesia.**—This method of causing analgesia for anorectal operations is seldom employed because of the difficulty in locating openings on the anterior surface of the sacrum (Fig. 99) with the needles.

**Regional Anesthesia.**—Nerve-blocking, conduction, or regional anesthesia may be induced by injecting the anesthetizing agent into the spinal and sacral canals, nerve, or perineural tissues. Following anesthetization or compression of the nerve by the solution areas supplied by it are operated without pain.

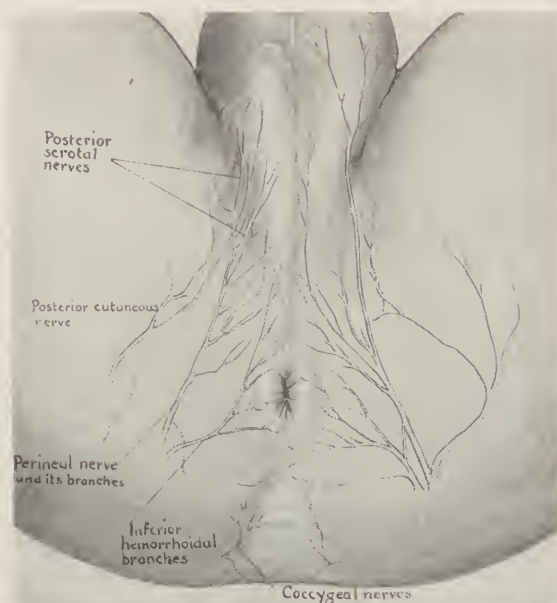


Fig. 100.—Showing location and distribution of superficial and deep sensory nerves of the anorectal region, an understanding of which is necessary for operations performed under local anesthesia.

Endoneural and perineural are more effective when made in close proximity to the operative field. Regional anesthesia, except when induced by spinal or sacral injections, is not applicable to anorectal surgery, for controlling nerves are numerous, small, difficult or impossible to locate, and because local or infiltration anesthesia is universally satisfactory in this class of cases, hence the procedure does not deserve further consideration.

**Local—Infiltration—Anesthesia.**—Since 1906 more than 80 per cent. of the author's private and clinic anorectal and many abdominal operations have been performed under infiltration anesthesia induced by eucain, sterile water, normal salt solution,



and other local anesthetic agents, with satisfactory results. He has operated over 5000 times under local anesthesia without a death, dangerous toxic manifestation, or other serious complication. In the beginning, owing to imperfect technic and employment of solutions of different strengths, patients generally squirmed or complained of pain, and in a few instances general was substituted for local anesthesia, complications not encountered in fifteen years, since he adopted his present technic and discarded other agents for beta-eucain—lactate or hydrochlorate—which invariably produces complete desensitization of tissues without toxic manifestations when employed in a  $\frac{1}{8}$  of 1 per cent. solution.

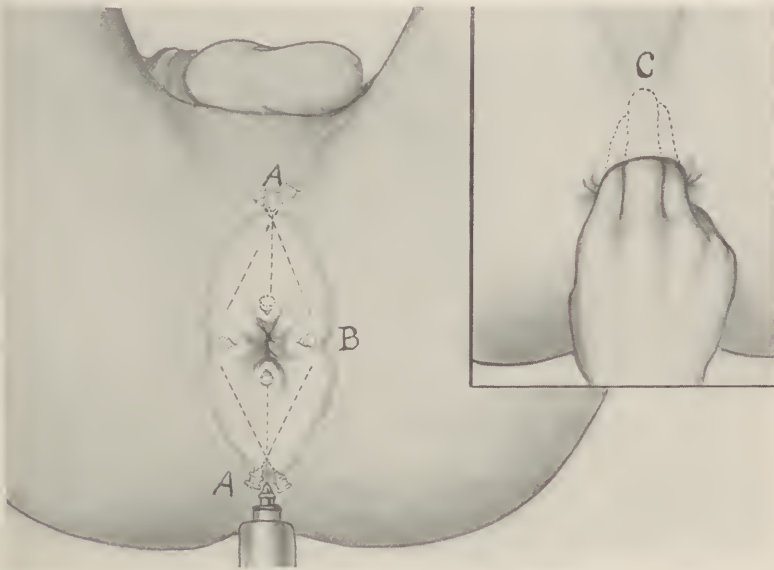


Fig. 101.—Technic of anesthetizing superficial and deep structures when the sphincter is divulsed or incised or the anal canal is operated upon. Position of needles: *A*, For superficial; *B*, deep infiltration anesthesia; *C*, divulsion of sphincter and anal canal with fingers.

The scope of infiltration anesthesia has been greatly extended, and physicians, surgeons, and proctologists who do not perfect their technic and employ it largely to the exclusion of general narcosis do not deserve the patronage of patients afflicted with the minor anorectal affections enumerated below.

Infiltration anesthesia possesses many desirable features, but has its limitations. The author never employs it except he has *ascertained beforehand what is to be done*, and discards the method in favor of spinal or gas-ether anesthesia for extensive, deep operations where an *unknown* amount of cutting may be required.

General anesthesia is also preferred for fistulectomy, hemorrhoidectomy, divulsion or division of the sphincter muscle for fissure, and other minor operations complicated by a *more serious rectal disease*, when the tissues are *necrotic*, or there is an *ulcer* or *fistulous* opening that prevents *retention* in and desensitization of tissues by the anesthetizing solution.

To aid the reader in forming an opinion concerning indications for *general* and *local* anesthesia in this class of work the author has grouped affections most frequently encountered about the terminal bowel as follows:

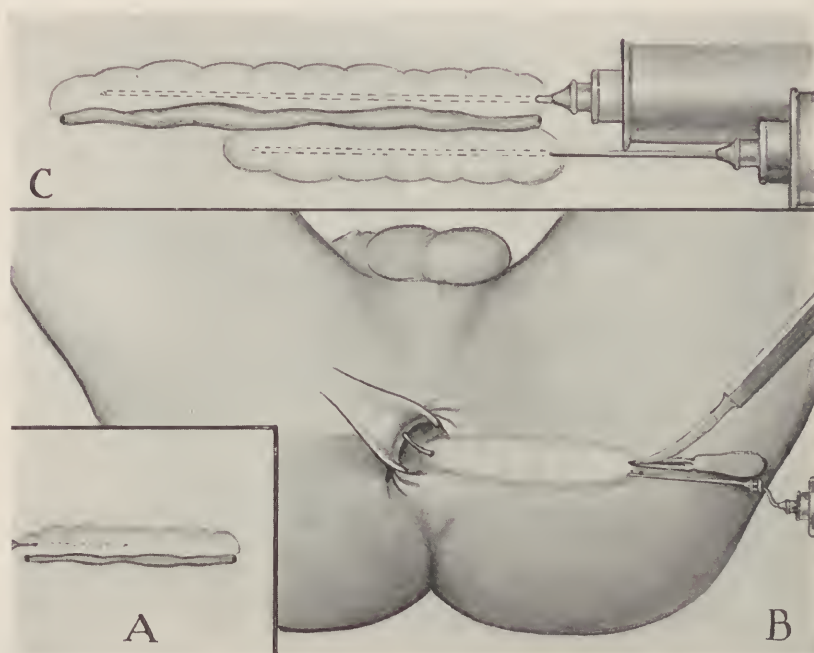


Fig. 102.—Technic employed by the author in local anesthesia fistula operations: *A*, Infiltrating the tissues; *B*, dividing structures overlying the sinus; *C*, method of anesthetizing structures on either side when a fistula is to be excised or split in both directions.

Anorectal and abdominal operations *operable* under local anesthesia.

Anorectal and abdominal operations *inoperable* under local anesthesia.

**Anorectal and Abdominal Operations Operable Under Local Anesthesia.**—*Internal, protruding, bleeding, capillary, combination, external, cutaneous, and thrombotic hemorrhoids; fissure in ano; ulcers in the anal canal, single and multiple; superficial, long, and short fistulæ; procidentia recti—first and second degree; cryptitis,*

*inflamed hypertrophied papillæ; marginal, submucous, and ischio-rectal abscesses; polyps; strictures—below peritoneal attachments; foreign bodies—embedded beneath the mucosa or skin near the anus; constipation incident to sphincteralgia; hypertrophy of the levator ani muscle, narrow anal canal; intrarectal diverticula and cysts; incipient anal epithelioma; perianal cysts, tumors, condylomata (Fig. 103); fecal impaction; pruritus ani (Fig. 104); coccygeal affections; sacral dimples, dermoids, and fistulæ (Fig. 102); fecal incontinence; repair of anorectal injuries, congenital malformations, and sequelæ of operations.*



Fig. 103.—Author's painless local anesthesia operation for the removal of luetic and non-syphilitic condylomata: *A*, Method of anesthetizing the skin beneath vegetations; *B*, excising warts; *C*, raw areas left after their removal.

The author has many times performed *exploratory celiotomy, colostomy, appendicostomy, appendectomy, cecostomy, ileostomy, sigmoidopexy, colopexy, uterine suspension*, and other abdominal operations, including *breaking up of adhesions, division of Jackson's membrane, straightening Lane's kinks*, and *coloplication* under eucain anesthesia. In some the operation was painless, but in other instances the patient suffered slightly upon incision of the fascia, peritoneum, or pulling on the mesentery.

Experiments with infiltration anesthesia in this class of work

has convinced the author that *general*—gas-ether or gas-oxygen—is preferable to *local* anesthesia for abdominal operations where *considerable handling of the intestines or viscera may be required*, and when bowel is complicated by some other abdominal disease.

The author has several times relieved *acute intestinal obstruction* by opening the abdomen and draining the bowel under local anesthesia, and has many times performed the secondary operation of excising the gut, opening the cecum or small intestine, or amputated the appendix when performing *colostomy, cecostomy, ileostomy, or appendicostomy*.

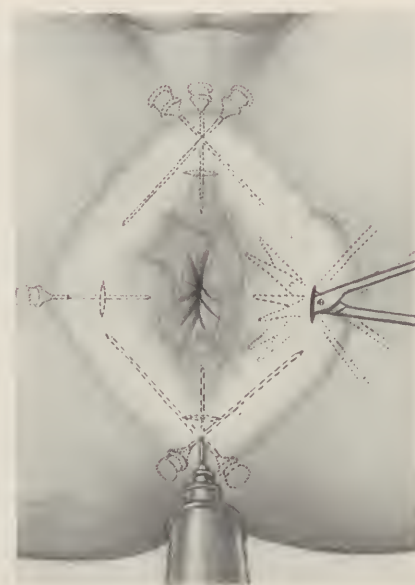


Fig. 104.—Author's local anesthesia buttonhole operation for pruritus ani where subcutaneous nerves of the perianal region are severed from the skin. Note direction of needles, button-holes on either side of the anus, and manner in which nerves are divided with scissors.

**Anorectal and Abdominal Operations Inoperable Under Local Anesthesia.**—*Cancer*—barring anal epithelioma; *extensive perirectal and sloughing ischiorectal abscesses*; *deep burrowing and complicated horseshoe perirectal, urethral, some vaginal, and vesicorectal fistulæ*; *strictures*; *extensive ulceration*; *large cysts*; *large, high non-malignant tumors*; *embedded foreign bodies*; *high submucous abscesses and fistulæ*, and *any disease or injury requiring amputation or resection of the lower bowel requires general anesthesia*.

*General* is also preferable to *local* anesthesia for most procedures and plastic operations that require stitching in and about



the rectum, except those employed in fistulectomy and hemorrhoidectomy, and the same obtains when a minor is complicated by a more serious rectal affection, or when any lesion cannot be brought into view for operation.

A study of diseases included in the above lists shows that more than 80 per cent. of anorectal affections are located within easy reach and are operable upon under local anesthesia.

*Posture.*—The exaggerated *knee-chest*, *lithotomy*, or *left Sims'* posture may be employed, but the author prefers the last, because it is convenient for him and comfortable for the patient during short or long operations upon the buttocks, anus, or lower rectum.

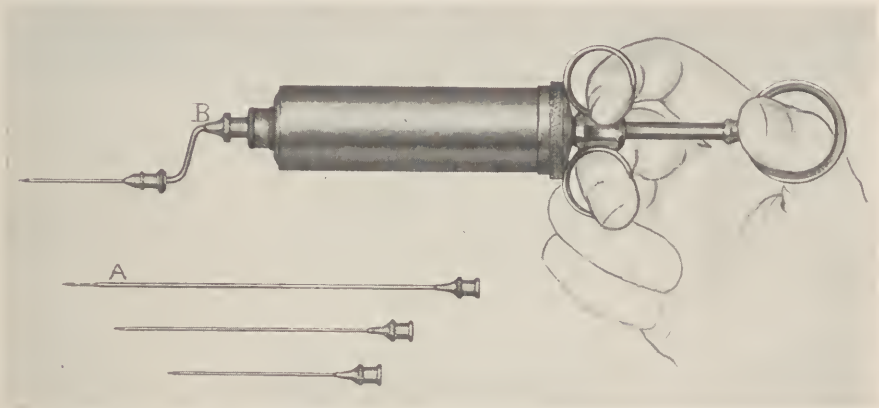


Fig. 105.—Large metal syringe with author's goose-neck attachment employed in abdominal and anorectal local anesthesia operations: *A*, Needle having a shoulder used for injecting hemorrhoids with quinin and urea and for infiltration anesthesia when it is not desirable for the needle point to penetrate the rectal wall; *B*, author's goose-neck attachment which enables the operator to keep the needle point in view at all times.

*Apparatus.*—The paraphernalia necessary for most anorectal operations under infiltration anesthesia are a *dilator*, employed to divulse the sphincter and anal canal; self-retaining anoscope (Fig. 71); *slide speculum*—different sizes—through which hemorrhoids, fistulæ, fissures, ulcers, and other lesions are exposed, probed, or operated on; half a dozen blunt or sponge *forceps* that do not lacerate mucosa or tissue under traction; spool of strong *harness linen* which does not break or form irritating knots; proctoscopes—different sizes—through which gauze plugs are easily inserted; the author's *dressing rod*, which does not penetrate the gauze and injure the tissues while dressings are being introduced; 2- or 3-ounce (60–90 c.c.) metal Record *syringe*, to which is attached a Gant goose-neck extension that enables the operator at all times

to keep the needle point in view (Fig. 105, *B*); and several beveled, strong, reinforced, large caliber hollow *steel needles* of various lengths—1 to 3 inches (2.54–7.62 cm.) (Fig. 105, *A*).

Metal are preferable to glass syringes, which break easily or leak under pressure during skin, fistula, and stricture infiltration, where tissues are dense. Small needles are objectionable because they readily break or become blocked by corrosion or ingredients of the solution. Silk has been discarded for heavy *harness linen*, which is less expensive, considerably stronger, more desirable



Fig. 106.—Author's technic of anesthetizing hemorrhoids: *A*, Needle is introduced directly into the tumor when entirely covered by mucosa, and *B*, first into the mucous side and then beneath the integument in combination piles; a maneuver that entirely prevents sharp pain caused by the needle when introduced into the skin. Dotted line indicates V-shaped incision employed by the author when excising integument with the hemorrhoid.

under sterilization, and causes less irritation, since it knots smaller and the ends become frayed.

Broad, blunt, or sponge are far superior to the pointed artery forceps, because they hold better and do not tear tissue or cause necrosis or hemorrhage by injuring tissue. Specula other than those possessing a window or sliding door induce pain upon introduction and permit the skin or mucosa to infold and obstruct the view when opened. Blunt Mayo scissors and knives of special make (Fig. 193) and a set of the author's probes (Fig. 77) and

grooved director are essential to the proctologist operating under local anesthesia.

**Local Anesthetics.**—Anesthetizing agents save the patient considerable suffering in the *palliative* and *operative* treatment of anorectal diseases.

**Palliative Treatment.**—Suffering incident to examination, instrumentation, cauterization, and treatment of sensitive individuals is prevented or minimized by placing a pledget of cotton

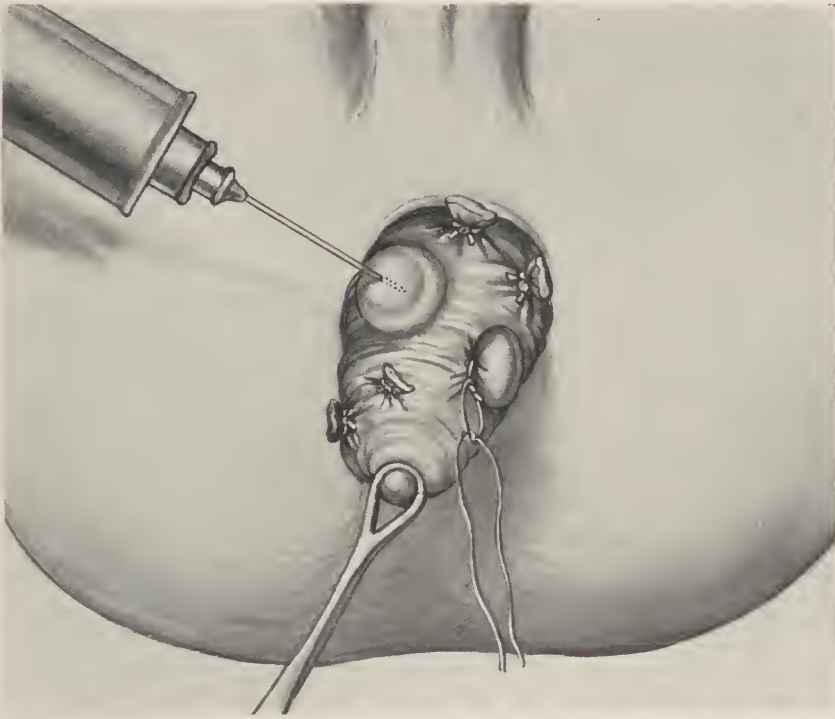


Fig. 107.—Author's local anesthesia operation for procidentia recti, showing infiltrated area, bunch of mucosa being ligated, and four ligatured stumps left following excision of mucosa.

soaked in cocain, eucain, or novocain 10 per cent. upon lesions of the mucosa or perianal skin and letting it rest there for a few moments. These agents do not induce as complete anesthesia here as in the throat when directly applied, but effectually desensitize the part when injected into or beneath the sensitive area.

Orthoform, alypin, anesthesin, analgin, and similar agents which possess analgesic and healing properties markedly diminish pain and muscular irritability incident to walking, sitting, defecat-

ing, and treatment of local lesions; they are employed in the form of a powder, suppository, solution, or an ointment, and deserve a place in the armamentarium of the proctologist.

Eucain and cocain solutions are also useful for mitigating and arresting unbearable itching or pruritus ani.

**Operative Treatment.**—Numerous agents have been employed for anorectal operations, viz.: *ether spray, liquid air, ethyl chlorid, cataphoresis, and beta-eucain, cocain, stovain, novocain, sterile water, normal saline solution, quinin and urea, hemesia, and apothesis.*

*Ether Spray, Ethyl Chlorid, and Liquid Air.*—These agents deaden or prevent cutting pain by benumbing or freezing tissues, but are unsatisfactory in this class of work because they induce acute initial and postoperative suffering, are often followed by sloughing, and when effective induce only superficial anesthesia which limits their employment to *light* incisions of the mucosa and skin.

*Cataphoresis.*—Years ago the author abandoned this method of anesthetization because an extensive electric equipment and an elaborate preparation of the patient were necessary, desensitization was incomplete, and it required a longer time and more trouble to produce anesthesia than with beta-eucain infiltration.

*Eucain, Cocain, Stovain, Novocain, and Tropacocain.*—These agents have their respective adherents and have been successfully employed in varying strengths to produce spinal, paravertebral, sacral, and local anesthesia for abdominal, anorectal, pelvic, and operations upon the buttocks and sacrococcygeal region.

These drugs, particularly cocain, often produce annoying or alarming toxic manifestations when used strong—3 to 10 per cent.—but in a weak solution they are effective and seldom disturb the patient or worry the doctor when injected into the tissues in small or large amounts. The majority of operators employ  $\frac{1}{2}$  of 1 to 2 per cent. solution, which is stronger than required to induce complete desensitization of the tissues.

Extensive experiments made in 1900 and later<sup>1</sup> convinced the author that the anesthetizing action of the solution is due both to the *contained chemical* and to *distention* of the tissues and *compression of the nerves*; for he observed that infiltration anesthesia failed or was incomplete when part or all the fluid escaped through needle punctures, necrotic tissue, ulcer, or fistulous opening, and proved by hundreds of anorectal operations performed under

<sup>1</sup> See numerous articles published by the author on local anesthesia, 1902–1920, and in his works "Diseases of the Rectum and Anus," "Constipation, Obstipation, and Intestinal Stasis," and "Diarrheal Inflammatory and Parasitic Diseases of the Stomach and Intestines."



sterile water and normal saline infiltration anesthesia that desensitization immediately followed when the tissues were distended with the fluid until glassy white, which indicates complete analgesia.

Repeated experiments with eucain—lactate and hydrochlorate—cocain, novocain, stovain, tropacocain, and like agents have satisfied the author that eucain is the anesthetic of choice. During the last fifteen years he has operated more than 5000 times under eucain infiltration without an accident or failure to obtain complete anesthesia; a  $\frac{1}{8}$  of 1 per cent. solution was employed and patients were able to walk from the operating room to their bed, and did not exhibit toxic manifestations during or following operation.

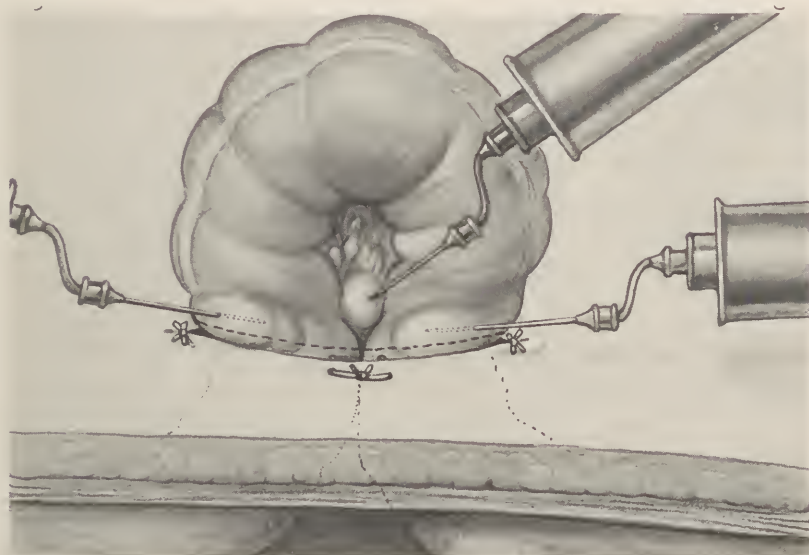


Fig. 108.—Direction taken by anesthetizing needles in author's painless method of removing the gut in sigmoidostomy and colostomy.

Eucain possesses the following *advantages*: properly handled, it never fails to induce complete anesthesia in ten to thirty seconds, is absolutely non-toxic in a  $\frac{1}{8}$  per cent. solution, retains its strength indefinitely, can be resterilized, does not cause irritation, has no objectionable features, and may be safely employed in any amount from a few drops to many ounces.

Adrenalin—1 : 1000—added to the anesthetic solution quickens the action and extends duration of the analgesia and lessens hemorrhage during operation, but the author seldom employs it because blood-vessels temporarily constricted later may relax

and bleed freely. The author prefers that hemorrhage take place during the operation, that it may be immediately and permanently controlled. Eucain may be put up in distilled water, decinormal salt, or a soda solution, which is atonic and causes less irritation than plain water.

*Sterile Water and Normal Salt Solution.*—During the period 1901–05 the author published a series of papers giving the advantages and technic of local anesthesia—distention—induced by the injection of sterile water and normal salt solution, and reported several hundred cases of abdominal and anorectal diseases successfully operated on under these agents. Subsequently sterile water was abandoned for eucain anesthesia solely because its initial injection induced more pain than eucain.

*Quinin and Urea Hydrochlorid.*—This anesthetic is effective, non-toxic, suitable for long and short operations, minimizes post-operative pain for forty-eight hours, is soluble in water, and can be sterilized. When injected the solution causes greater pain than eucain and takes longer—several minutes—to induce complete analgesia. Quinin and urea is not desirable for skin operations, since the solution always causes induration and frequently sloughing of the integument, which delay healing. It is effective when employed in a  $\frac{1}{4}$  to 1 per cent. solution.

The author sometimes resorts to quinin and urea anesthesia in the clinic or office when operating on patients who cannot go to bed and must continue their work; under such circumstances the anesthetic is ideal because it lessens postoperative and defecatory pain during the acute stages of healing.

*Hemesia*, composed of a 2 per cent. quinin-urea solution to which is added chloral gr.  $\frac{1}{15}$  (0.004), produces a quick and effective anesthesia and supposedly less often causes sloughing, but otherwise possesses no advantages over the weaker solution of quinin and urea.

*Aposthesine*,  $\frac{1}{2}$  per cent., also makes a satisfactory local anesthetic.

*Technic.*—Patients are prepared for anorectal local anesthesia operations by the administration of a light laxative the previous night and a small enema prior to their entering the operating room; this is followed one hour before operation by a hypodermic of morphin, gr.  $\frac{1}{4}$  (0.016), to mitigate or prevent postoperative pain; place the patient in a comfortable posture convenient for the operator—usually left Sims’—cleanse, dry, and paint the perianal skin with weak iodine, swab the rectum with hydrogen peroxid or surgical iodine, and expose the parts by instrumentation or separat-

ing the buttocks. Shaving is omitted except when *sutures* are to be employed, to avoid the subsequent annoyance from outgrowing hairs.

Final preparation includes sterilization of the hands, instruments, and solution, the strength of which is verified. The author warns his patients that they will feel the initial *needle prick*, otherwise they squirm or jump, making reintroduction of the needle necessary. Pain incident to puncture is lessened or prevented by momentarily compressing the tissues between finger-tips, touching the skin with carbolic acid or spraying it with ethyl chlorid. Suffering incident to the first injection is also minimized by introducing the needle slantingly into and then under the integument instead of at a right angle, and with a quick, sure instead of a slow, unsteady movement.

Pain is less acute when a drop or more of the solution is deposited between integumentary layers and intrasubcutaneous and deeper structures step by step, then carried forward as the skin assumes a *glassy white* appearance, which indicates complete anesthesia. When an additional amount of the anesthetic is required pain is avoided by inserting the needle within the anesthetized area. Care is exercised to prevent escape of the solution through multiple needle punctures, an ulcer, or fistula. It is advisable to precede anesthetization by markings—iodin or methylene-blue—to outline the operative field.

Initial pain from the injection is avoided in hemorrhoidal and other operations by inserting the needle first into the mucosa and subsequently infiltrating the skin.

The tissues are infiltrated until *blanched*, which requires 6 minims for the removal of an anal papilla, 20 drops for an external pile,  $\frac{1}{2}$  to 1 teaspoonful for internal or combination hemorrhoid, and 1 or more ounces for an extensive fistula or the author's pruritus operation (Fig. 104).

*Abdominal Local Anesthesia.*—The principles being about the same as for local anesthesia elsewhere, the author omitted a detailed description of the technic of producing local anesthesia for abdominal operations, which is clearly shown in the accompanying illustrations (Figs. 109, 110).

The expert in local anesthesia works quickly, and the majority of other than abdominal operations are performed in five or ten minutes, following which the patient is permitted to get off of the table and return to his room. When large vessels have been injured they are tied if convenient; if not, hemorrhage is controlled by a large gauze plug introduced through an operating procto-



scope over which is placed a Gant pyramidal-shaped compress supported by a snugly adjusted T-binder.

Following extensive operations an assistant is instructed to readjust dressings when the patient is placed in bed, since they often become displaced after his leaving the operating room. When these precautions are taken serious bleeding need not be feared, because hemorrhages are rare following local anesthesia operations, since the patient does not vomit, cry, strain, pull off dressings while semiconscious, or throw himself about, as after general narcosis.

In the hands of the expert *local* is far superior to *general* anesthesia because operator and patient need not worry over the immediate danger of the narcosis, heart, lung, circulatory, nephritic, and other complications, the terror of unconsciousness is avoided, anesthesia is accomplished in a few seconds, the patient need not enter the hospital the night before, can eat or drink what he pleases immediately prior to and following operation, can walk to and from the operating room, return to his home shortly thereafter in suitable cases, and does not suffer from nausea, vomiting, headache, and intensified pain or postoperative hemorrhage so frequently observed following etherization.

The author is often asked if patients pay as much for a five- or ten-minute local as for a general anesthesia operation where the sufferer is placed in an expensive room in the hospital, made to pay for an anesthetist, trained nurse and extras, and is kept in bed from one to two weeks. To these queries he would say that since he abandoned *general* for *local* anesthesia and began to permit patients to immediately go home or leave the hospital in one, two, or three days, or as soon as safe, and come to the office for dressings, his fees have been larger and his patients have appeared to be more grateful.

**Local Anesthesia in Abdominal Operations.**—Infiltration anesthesia is not so universally satisfactory for abdominal as anorectal and surface operations, where it is nearly always effective. The procedure is contraindicated in this class of operations unless the operator knows *beforehand* just what is to be done, and local anesthesia is not suitable for many deep abdominal and pelvic lesions, extraction of tumors, where viscera are matted together by adhesions, and when there are complicating diseases within the abdomen.

The author has performed 55 abdominal operations including *appendicostomies*, *appendectomies*, *cecostomies*, *enterostomies*, *colostomies*, *cecopexies*, *cecoplications*, *colotomy*, *sigmoidopexies*, and operations for *Jackson's membranes*, *Lane's kinks*, *adhesions*,



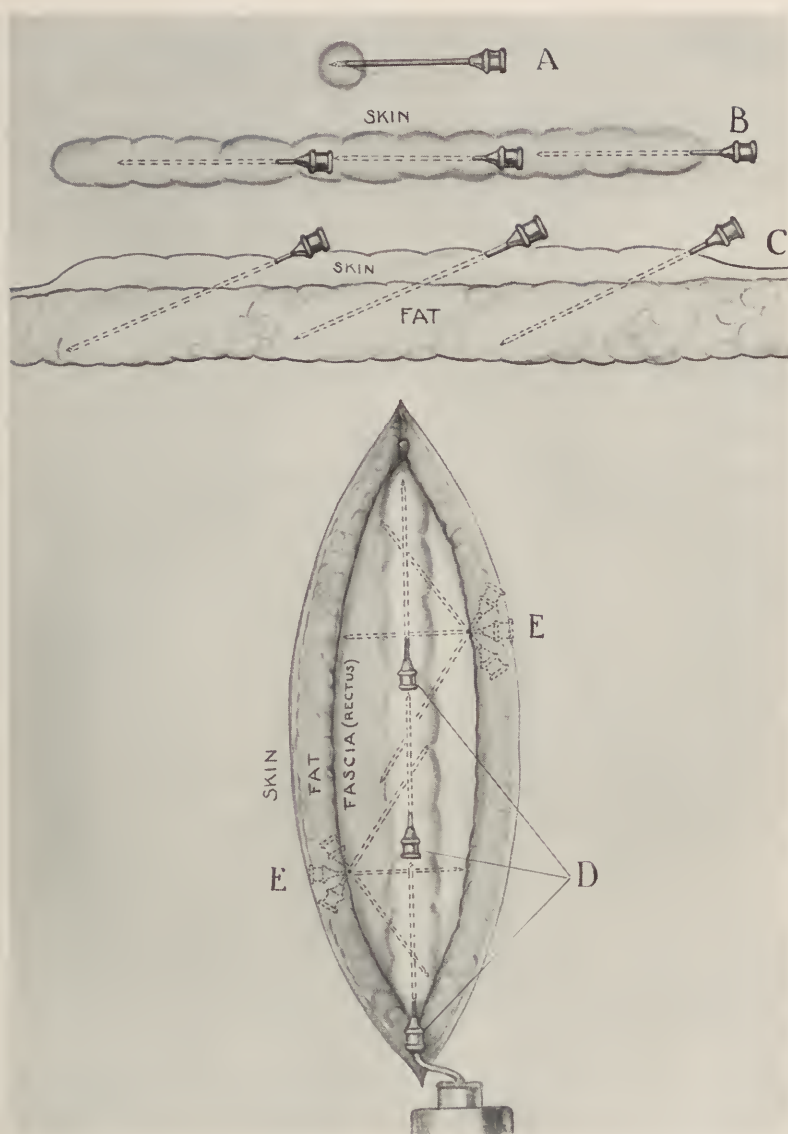


Fig. 109.—Abdominal local anesthesia. Author's technic of anesthetizing structures layer by layer in abdominal operations using syringe fitted with his goose-neck attachment (Fig. 105): *A*, Bleb formed by initial injection of anesthetic between tegumentary layers; *B* injection of skin along the line of incision; *C*, anesthetization of subcutaneous fat; *D*, injection of rectus fascia; *E*, direction taken by needles when the rectus muscle is anesthetized.

*angulations*, etc., some of which were performed under sterile water anesthesia and reported in a series of papers published between 1902–05.

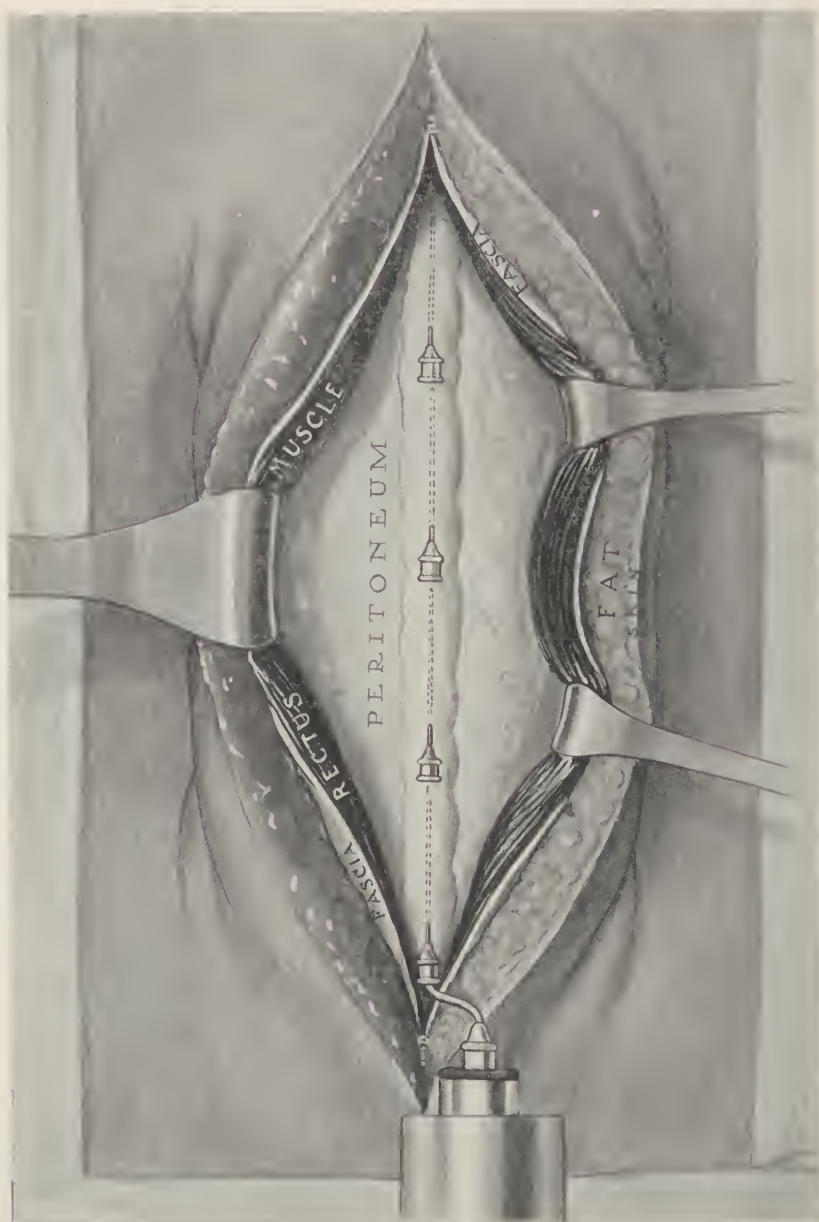


Fig. 110.—Abdominal local anesthesia. Technic employed by the author in abdominal local anesthesia operations. The skin, fat, fascia, and rectus muscle anesthetized after the plan demonstrated in the preceding illustration, and retracted to show the manner in which peritoneum is infiltrated with aid of the author's goose-neck syringe, which enables the operator to introduce the needle parallel with the structure being injected.

The majority of the above-named procedures are adaptable to local anesthesia because deep exploration is often unnecessary, pulling upon sensitive mesentery is seldom required, and pinching, cutting, and suturing of the unanesthetized gut causes little or no pain. Discomfort from the majority of these abdominal operations is avoided by the expert in local anesthesia who carefully prepares and injects his solution slowly, cautiously infiltrating each abdominal *layer* (from skin to peritoneum) *separately*, which usually requires about three minutes each for the skin, subcutaneous structures, muscles, fascia, and peritoneum.

The principles in abdominal are in the main the same as those employed in local anesthesia anorectal operations previously described, and the analgesic action of the anesthetic is due both to

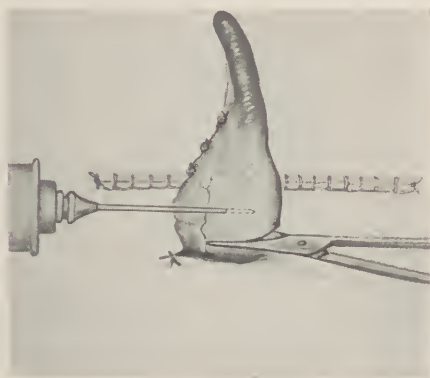


Fig. 111.—Anesthetizing and excising the appendix in the author's local anesthesia stab-wound appendicostomy.

*distention pressure* on the nerves and *chemical* contained in the solution.

The author prescribes morphin, gr.  $\frac{1}{4}$  (0.016), and scopolamin, gr.  $\frac{1}{200}$  (0.0003), one hour preceding local abdominal anesthesia operations, and repeats the dose fifteen minutes before operation in *robust* individuals to blunt consciousness and quiet apprehension in nervous patients.

*Technic.*—A careful study of the accompanying illustrations (Figs. 109, 110) with their descriptive legends explains and shows the manner in which abdominal local anesthesia is accomplished by the author and renders further description of the *technic* unnecessary.

Anesthesia is more effective when the anesthetic is used liberally and the solution is slowly diffused into the operative field. Satisfactory surgical analgesia is produced with eucain  $\frac{1}{8}$ , novo-

cain  $\frac{1}{2}$ , or aposthesin 1 per cent. in combination with adrenalin 1 : 1000, which *quickens* and *lengthens* action of the anesthetic, with but little danger of causing toxic manifestations even when the solution is used freely.

Wiener,<sup>1</sup> who has successfully performed a considerable number of abdominal operations for different lesions under local anesthesia, employs a 1 per cent. solution of novocain or aposthesine to an ounce to which 5 or 6 drops of a 1 : 1000 solution of epinephrin have been added. He also inserts a small drain beneath the skin which drains the serum into the dressings.

Labat maintains that complete anesthesia of the pelvis and contents can be accomplished by blocking the last three lumbar and five sacral nerves.

<sup>1</sup> Joseph Wiener, Medical Record, January 25, 1919.



## Chapter VII

### Malformations—Anomalies of the Anus and Rectum

CONGENITAL anorectal deformities are encountered with a frequency corresponding to malformations affecting other parts of the body. They were mentioned by the ancients, and an operation for their relief was described in the seventh century, but they did not receive merited attention until following Amussat's article (1835) which clearly indicated the operative treatment required in this class of cases. Bodenhaumer (1860) published an exhaustive



Fig. 112.—Photograph and roentgenogram of S. Chelliatis' case of symplus apus. Note peculiar formation of the perianal region.

treatise on anorectal malformations and tabulated 287 cases including all types of deformity encountered in this region.

Statistics show that the anus or rectum is malformed in about 1 in every 10,000 infants.

Congenital defects of the rectum and anus are encountered more frequently in males than females, and are often met with



Fig. 112A.—The Jones twins. (Huff, in "American Journal of Obstetrics," vol. xxii.)

in infants afflicted with congenital anomalies elsewhere, such as spina bifida, atresia of the urethra or vagina, retained testes, hypo-



Fig. 113.—Radiograph of a monster, derodidymus (dicephalus), having two heads, two upper and lower extremities, and but a single body and rectum (W. M. Beach).

spadias, exstrophy of the bladder, hair-lip, cleft-palate, club-foot, absence of the coccyx, transposition of the colon, and abnormalities affecting the cecum or sigmoid flexure.

The Jones' twins, described by Huff,<sup>1</sup> "Both sets of genitals and ani were on the same side of the line of union, but occupied normal positions with reference to the legs on either side."

Malformations may be *slight* and not produce troublesome manifestations (Fig. 119) until childhood or adult life, or be *serious* and cause death within a few hours or days, unless the block located at the anus or in the rectum is eliminated.



Fig. 114.—Congenital skin folds responsible for constipation and painful defecation. Insert shows method employed in removing them and closing wound under local anesthesia.

Where obstruction is partial serious consequences usually follow—constipation, fecal impaction and auto-intoxication, or digestive disturbances and inanition.

Many lives would be saved if the rectums of newborn infants who constantly cry or strain during defecation, and those suffering from constipation, diarrhea, procidentia recti, or abdominal distention were digitally examined or inspected through the proctoscope, either of which would demonstrate the presence and location of malformations, if any, responsible for the trouble.

<sup>1</sup> American Journal of Obstetrics, vol. xxii, p. 923.

Little is known concerning the *etiology* of congenital defects of the lower bowel other than that they result from developmental errors, peritonitis, prenatal enteritis, disturbances of the chorion that lead to the formation of adhesions, or distention caused by meconium.

The various types of anorectal malformations hereafter discussed are more easily understood when studied in connection with embryology of the colon, rectum, and anus discussed in Chapter I. Anomalies of the colon and sigmoid flexure have been described elsewhere.

**Classification.**—The many types of congenital defects of the lower bowel have for convenience of study been grouped under two headings, viz.:

1. Congenital malformations of the anus.
2. Congenital malformations of the rectum.

The appended tables, arranged by Keith and the author, give a fair idea of different types of anorectal deformities and comparative frequency with which they are encountered in males and females:

KEITH'S TABLE

Groups.	In Museum of Royal College of Surgeons.	In Museum of Metropolitan Medical Schools.	Total.
A. Males:			
1. Rectum opening in urethra . . . . .	7	26	33
2. Rectum ending as cord at or above base of prostate. . . . .	0	7	7
3. Rectum ending as cord at site of proctodeum . . . . .	2	5	7
4. Rectum ending blindly at proctodeum. . . . .	1	6	7
B. Females:			
1. Rectum ending in vulva or vagina . . . . .	1	5	6
2. Rectum ending in cord above upper fornix of vagina . . . . .	0	5	5
3. Rectum ending as cord at upper fornix of vagina . . . . .	0	3	3
4. Rectum ending as cord in vagina below upper fornix. . . . .	0	2	2
5. Rectum ending blindly or as a cord at site of proctodeum . . . . .	3	7	10
C. Miscellaneous specimens:			
1. Imperfect . . . . .	1	5	6
2. Imperforate rectum in females with male form of external organs . . . . .	3	3	6
3. Rectum opening abnormally . . . . .	1	0	1
4. Rare malformations . . . . .	2	3	5
5. Abnormalities of the rectum in domesti- cated animals . . . . .	16	0	16
	37	77	114



# MALFORMATIONS—ANOMALIES OF ANUS AND RECTUM 127

## SYNOPSIS OF 8 CASES OF CONGENITAL MALFORMATION OF THE RECTUM AND ANUS TREATED BY THE AUTHOR

No.	Sex.	Age.	Variety of deformity.	Treatment.	Result.
1	M.	36 hours.	Anus occluded by membranous tissue.	Membrane incised and anus dilated with finger.	Recovery.
2	F.	22 years.	Natural anus. Imperforate rectum opening into vagina, through which all feces were voided.	Rectal end of fistula freed from vaginal wall by elliptic incision. End of the rectum reached by a second incision, opened, brought down, and sutured in the normal anal site.	Recovery; partial incontinence.
3	M.	2 days.	Rectum ended in a pouch a finger length above the anus; fistulous communication between bowel and bladder.	Colostomy after efforts to reach and bring the rectum down failed.	Death five hours later.
4	M.	24 hours.	Anal aperture partially covered by skin.	Integument cut away and anus divulsed.	Recovery.
5	F.	5 days.	Imperforate rectum; anus natural.	Condition not suspected by attending physician until child was moribund, when I was called; operation refused.	Death in few hours.
6	M.	2 weeks.	Congenital narrowing of both rectum and anus.	Divulsion with bougies gave temporary relief; iliac colostomy eventually performed.	Recovery; still living.
7	F.	3 days.	Rectum ended in blind pouch 1 inch (2.54 cm.) above the anus.	Incision carried backward and upward until the rectum was located, opened, and united to skin at anal site.	Recovery; stricture.
8	M.	4 days.	Imperforate anus caused by fibrous partition extending entirely across lumen of the bowel about 1 inch (2.54 cm.) above the anus.	Membrane incised; trimmed off. Rectum divulsed immediately and at intervals of one week for six months.	Recovery; slight constriction at site of original trouble.

Since publication of the above table the author has treated 10 other cases, 6 males and 4 females, for different types of ano-rectal anomalies, with satisfactory results. He has also operated

upon 7 children and adults for stricture, fistula, fecal incontinence, and other sequelæ, the result of operations performed for the relief of congenital anomalies of the lower bowel, and has successfully closed an artificial anus made five years previous to relieve intestinal obstruction caused by an imperforate rectum.

#### MALFORMATIONS OF THE ANUS—ATRESIA ANI—IMPERFORATE ANUS

Of the several types of atresia ani, the following are encountered most frequently, viz.: (a) *Narrowing of the anus*, (b) *partial occlu-*

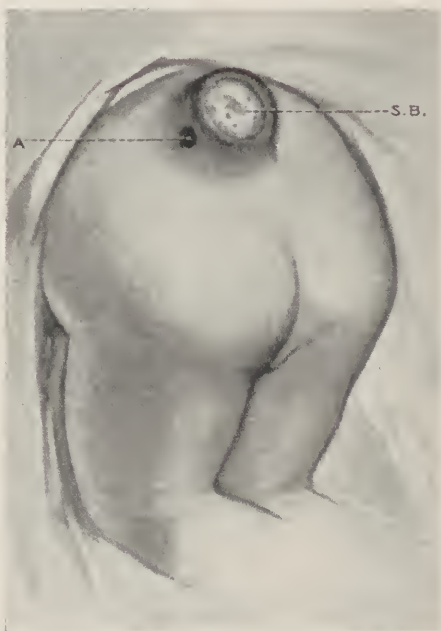


Fig. 115.—Imperforate rectum with spinal outlet. The child had a large spina bifida, S.B., the surface of which was ulcerated. At the left side of the spina bifida there was an orifice, A, through which all the feces passed. The anus was undeveloped. (From a drawing made from a patient under the care of the late Mr. W. I. deC. Wheeler.) (Reproduced from Ball, "The Rectum, its Diseases and Developmental Defects.")

*sion of the anus by membranous or fibrous tissue, (c) complete membranous occlusion of the anus, (d) abnormal location of the anus, (e) entire absence of the anus.*

The different varieties of congenital defects of the anus have been encountered in infants where the rectum communicated with the urethra, vagina, labia, perineum, or sacrococcygeal region (Fig. 115).

Total absence of the anus is usually noted quickly, but when

the anus is deformed or a deep dimple occupies its usual site, the defect is not suspected until hours or days later, when the infant cries, develops manifestations of obstruction, and it is realized the baby has evacuated little or no meconium or feces since birth.

As a rule, anal are less serious than rectal malformations because the anomaly is at or near the surface and can be quickly remedied by a simple operation or divulsion of the anal canal; while a reverse condition obtains in rectal anomalies.

**Narrowing of the Anus.**—Here the anus or anal canal is abnormally small or tight (Figs. 116, 117) and defecation is painful, difficult, or incomplete; the obstruction may be limited—annular—or involve a considerable extent of the terminal bowel—tubular.

Sometimes structures are apparently normal except the rectal outlet is unusually small; in other cases the anus or anal canal is

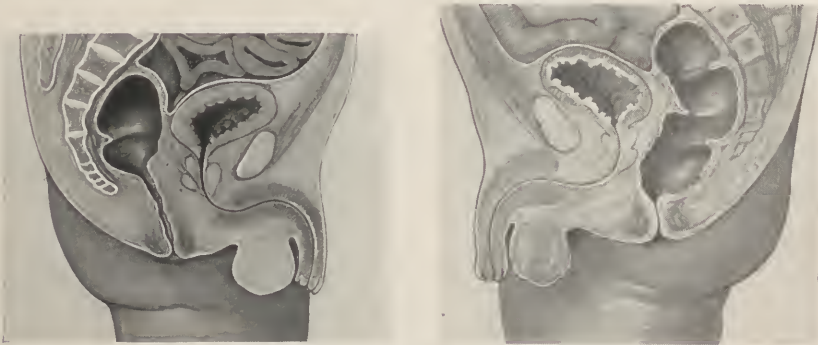


Fig. 116.—Congenital narrowing of the anus and lower rectum.

Fig. 117.—Congenital narrowing of the rectum and anus.

encircled by fibrous tissue which resists introduction of the finger or large probe in a manner similar to stricture resulting from pathologic lesions.

Occasionally narrowing of the anus does not seriously impair the infant's health, but later, as the stools become large and firm, it leads to the formation of stricture as the result of irritation.

**Symptoms.**—Briefly named in order of frequency, the manifestations caused by narrowing of the anal canal or anus are: dribbling of meconium, restlessness, constipation with fecal impaction, moderate bloating, crying, straining, and occasionally mucoid or bloody discharges.

**Diagnosis.**—Owing to infants having an opening at the usual site, abnormal narrowing of the anus is rarely suspected until symptoms of obstruction appear. Once thought of, the defect is readily discovered by digital examination, probing the rectum,

or inspecting the lower bowel through a diminutive proctoscope, and noting symptoms—frequent and incomplete evacuations, marked straining, and abdominal distention.

*Treatment.*—There is less cause for haste in these cases since obstruction is not complete, and where the baby has fairly complete evacuations operation may be deferred for weeks, months, or years.

Narrowing of the anus is occasionally corrected by divulsing the anus or lower rectum with finger, bougie, or proctoscope thrice

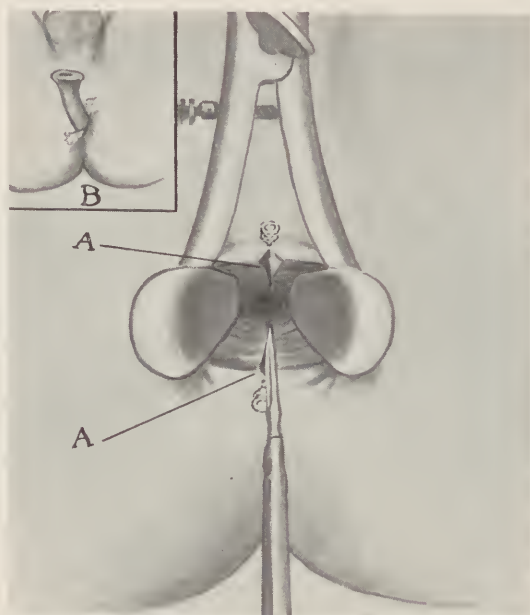


Fig. 118.—Local anesthesia operation for relief of congenital narrowing of the rectum and anus: *A*, Anteroposterior incisions; *B*, wounds drained and edges kept apart by the Wales bougie.

weekly during the first four weeks, and thereafter as indicated; but when obstruction is marked, the result of fibrous tissue involving circumference of the anal canal, stretching affords only temporary relief and the terminal bowel is freely incised at one or more points (Fig. 118).

Postoperative treatment following proctotomy embraces frequent cleansing and draining the wound with gauze, and occasional introduction of the finger or bougie to forestall undue contraction as healing takes place. When the rectum is abnormally narrow above the peritoneal attachment, *colostomy* is substituted for *proctotomy* because the latter is often complicated by peritonitis.



**Partial Occlusion of the Anus and Rectum by Membranes or Fibrous Bands.**—The author has treated several infants for



Fig. 119.—Partial anal occlusion caused by extension of the perineoscrotal ruga across the anus.

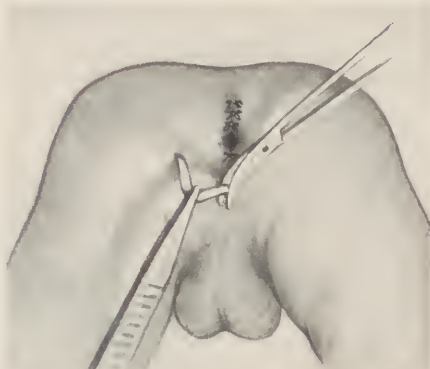


Fig. 120.—Obstructing fold; ruga excised with scissors, anus divulsed with finger, and wound closed with interrupted catgut sutures.

constipation induced by partial or complete membranous occlusion of the anus (Fig. 119) or lower rectum (Figs. 120, 121) or sequelæ



Fig. 121.—Diaphragmatic stricture of rectum. Note manner in which it is removed by a circular incision made with scalpcl.

the result of operations performed for their eradication. Usually the fold or membrane is comprised of skin (Fig. 123), but when the defect involves the anal canal obstruction is induced by abnormal

arrangement of the mucous membrane, a fibrous band, or connective-tissue partition that projects shelf-like from one side of the rectum (Fig. 124) or extends entirely around the bowel (Fig. 121) in the center of which is a large or small opening (Fig. 121) through which meconium and feces are evacuated.

The anus may be partially or completely concealed by an overlying skin fold (Fig. 122) or be obstructed by a fibrous band or an abnormal extension of the scrotal raphé (Figs. 119-122).

**Complete Membranous Occlusion of the Anus.**—In this class of cases the bowel is completely blocked by an extension of



Fig. 122.—Fibrous membrane extending laterally across the anus that induced partial obstruction and painful defecation. Note deformed ruga and method of excising the occluding membrane under local anesthesia.

skin across the rectal outlet or a connective-tissue diaphragm that completely occluded the anal canal (Fig. 124).

*Diagnosis of Partial and Complete Membranous Obstruction.*—Membranous malformations of the anus and lower rectum are readily detected when the anus is inspected or examined with the finger or hook probe (Fig. 77).

*Treatment.*—The treatment of membranous occlusion of the rectum or anus is simple and effective. Obstructive skin-folds and fibrous bands are obliterated by single or multiple incisions (Fig. 122), but when occlusion is marked or complete the membrane

or diaphragm is grasped with forceps and entirely removed with knife or scissors (Fig. 123). Membranous and bandular obstruction may be partially destroyed by forcible divulsion, but the procedure is dangerous and unsatisfactory.

Subsequent to elimination of the obstruction the rectum is packed to control bleeding, and later divulsed with the finger, proctoscope, or bougie to prevent contraction of the anal canal later.

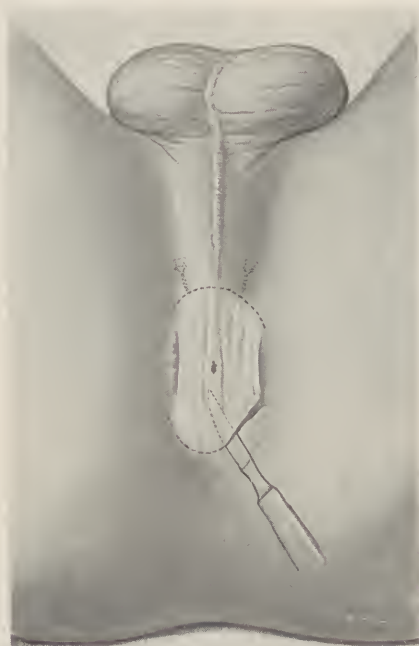


Fig. 123.—Enlarged perineal ruga and fibrous band extending across the anus in an anteroposterior direction that induced almost complete obstruction. Note lines of incision made in excising it.

**Abnormal Location of the Anus.**—This type of congenital deformity is rarer and more difficult to handle than malformations previously described. In one of the author's cases the anus was situated in the perineum near the scrotal attachment (Fig. 126), and in another it was located at the end of the sacrum, the coccyx being *absent* (Fig. 125). In the former the opening connected with the rectum through a fistula.

Sometimes the sphincter muscle surrounds the opening, and in other instances a normal anus is present at the natural *site*, while the rectum opens into the vagina, urethra, or finds an outlet through the skin of the perineal or sacral regions.

A *diagnosis* is easy and based upon finding of the opening through which meconium and feces are discharged.

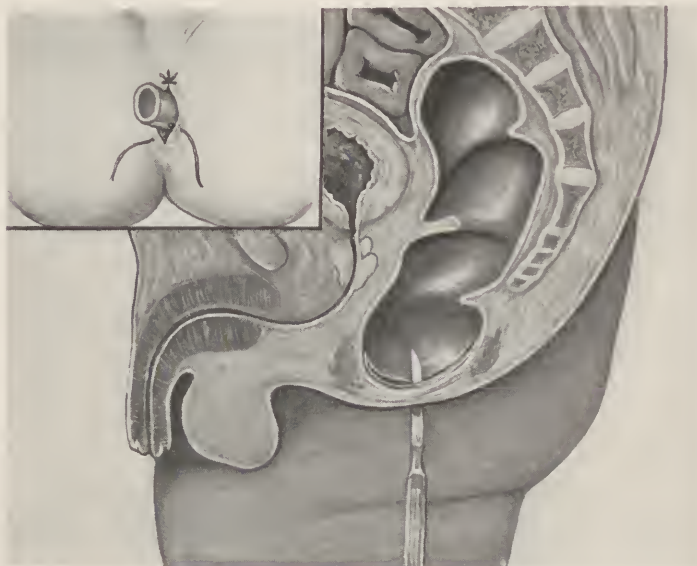


Fig. 124.—Closure of anus by fibrous tissue. Insert indicates the manner in which the obstruction was overcome.

*Treatment.*—In the author's case, where the opening was situated in the perineum, the sinus was incised backward to the

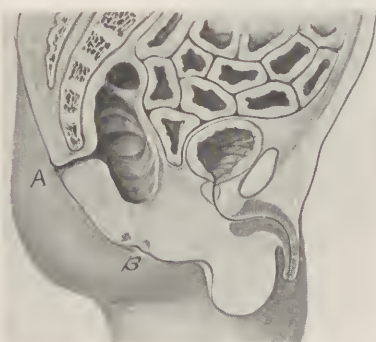


Fig. 125.—Imperforate anus, the rectum terminating (A) at the sacral end, the coccyx being congenitally absent; B, normal site of anus with sphincter in normal position.

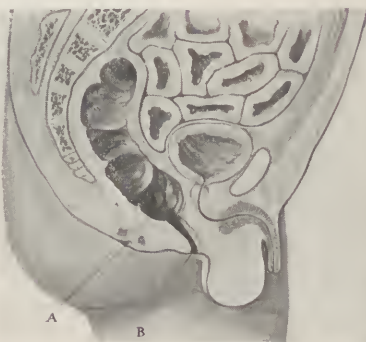


Fig. 126.—Imperforate anus (A), the rectum terminating (B) at the perineo-scrotal junction.

normal site of the anus (Fig. 127), then dissections were carried upward until the rectum was located, freed, brought down, ampu-



tated, and sutured to the anal skin (Figs. 128, 129), following which the bowel was irrigated. The operation was successful, and by careful postoperative handling the infant was provided with an almost normally functioning anus.

In the author's case of congenital absence of the coccyx, with anus located at end of the sacrum, the sphincter muscle was fully developed and daily evacuations procured with the aid of laxatives.

In this class of cases when a vent of sufficient size cannot be provided by incising and subsequently dilating the anus and tube

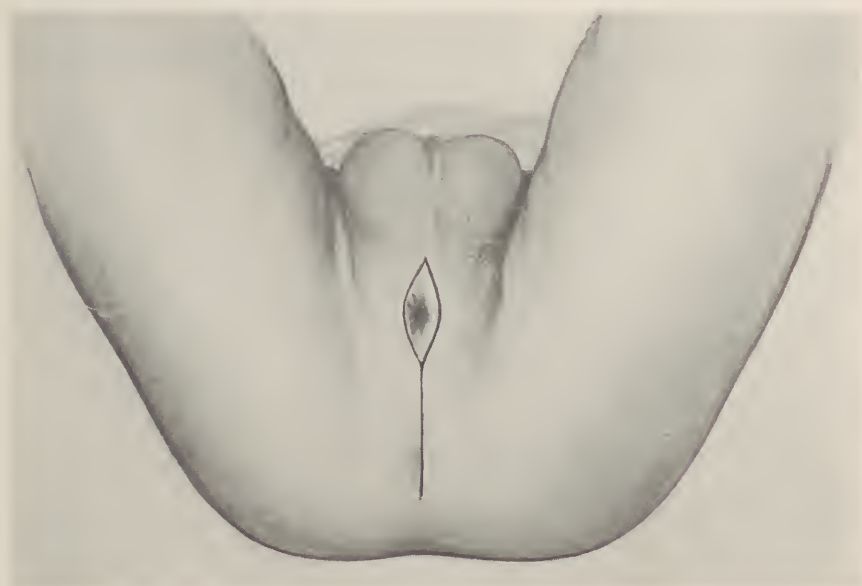


Fig. 127.—Author's operation for imperforate anus where the rectum terminates at the perineoscrotal junction. First step: Lines of incision.

communicating with the rectum, an artificial anus is established (Fig. 145) to forestall intestinal obstruction and stasis until the child is strong enough to withstand a plastic operation that would restore the bowel to its normal site.

**Entire Absence of the Anus.**—Total absence of the anus (Fig. 130) is recognized early, because even if malformation is not detected during the examination of the newborn infant, obstructive manifestations rapidly develop which cause the attendant to inspect the anus with the object of ascertaining why meconium and feces are not being evacuated.

The anal site may be marked by a deep dimple, ovoid depression, bulging caused by meconium, radiating rugæ (Fig. 122), a purplish spot, ridge, or smooth raised circular rim when the sphincter is normally situated.

When the rectum terminates  $\frac{1}{2}$  inch or more above the skin and the intervening space is filled with dense tissue integument is devoid of markings. It is well to remember that the anus may appear natural in cases where the rectum or anal canal are completely obliterated.

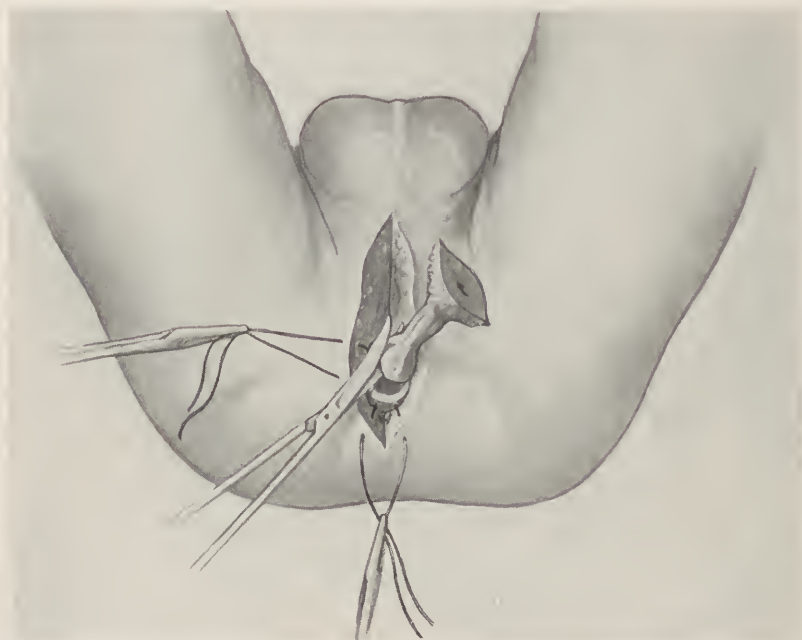


Fig. 128.—Author's operation for imperforate anus where the rectum terminates at the perineoscrotal juncture. Second step: Narrow distal end of the rectum dissected free, amputated, and proximal bowel stump anchored at the normal site of the anus with through-and-through sutures.

The *diagnosis* is made upon inspection, which demonstrates there is no vent for feces, together with vomiting, straining, abdominal distention, and other urgent symptoms of acute intestinal obstruction.

This type of anomaly is frequently associated with hypospadias, spina bifida (Fig. 115), exstrophy of the bladder, hare-lip, or other congenital defect.

*Treatment.*—The infant is operated on immediately absence of the anus is detected, for death occurs shortly unless obstruction

is relieved, and the mortality is considerably higher when the operation is delayed for two or three days.

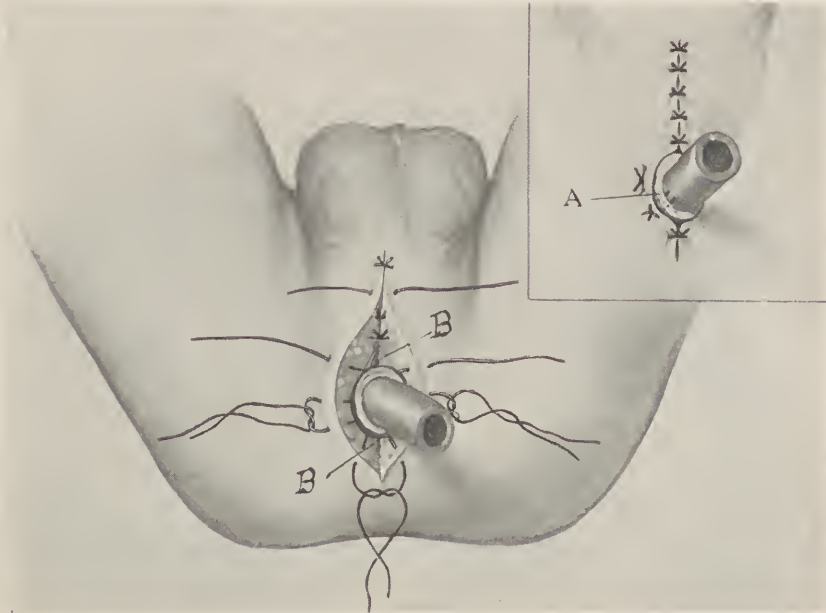


Fig. 129.—Author's operation for imperforate anus where the rectum terminates at the perineoscrotal junction. Third step: Wound closed by deep and superficial sutures: *A*, Rubber tube anchored in the bowel; *B*, approximated split ends of sphincter located at the normal anal site.

In extreme cases one is justified in puncturing tissues and gut to allow the intestinal contents to escape through a trocar or aspirat-



Fig. 130.—Imperforate anus, the rectum ending in a blind pouch.

ing needle, but the procedure is to be condemned in the average case.

In the majority of instances of entire absence of the anus a vent for retained meconium and feces is quickly and safely made by an incision carried through the skin, membrane, or tissue covering or occluding the anus upward and into the rectum; the cut is free to allow for drainage and contraction as the wound granulates, and when there is a normal or rudimentary sphincter it is preserved, for by so doing fecal incontinence is often prevented.

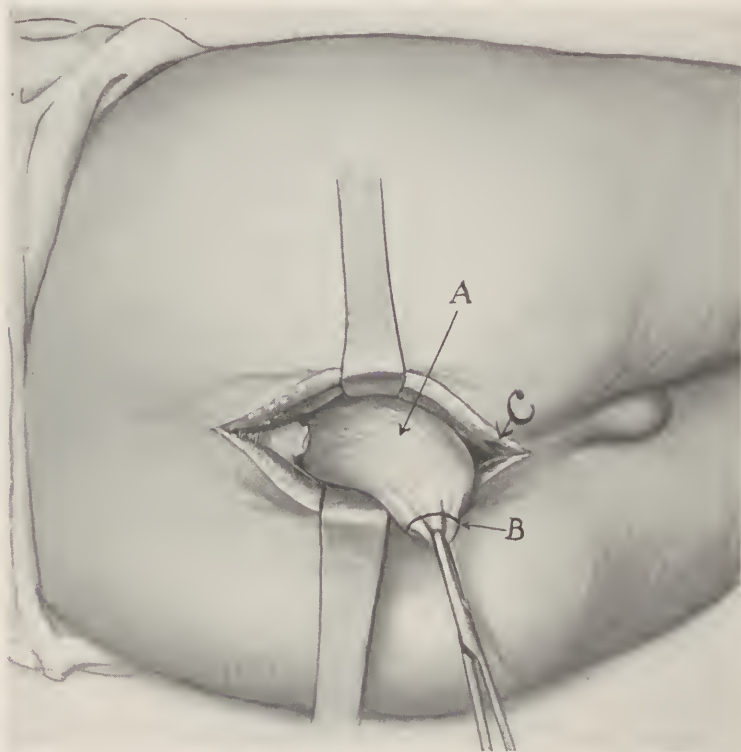


Fig. 131.—Author's operation for imperforate anus where the rectum ended in a blind pouch. First step: Through a posterior median incision (*A*) the rectum is freed, brought outside, and (*B*) opened; *C* indicates location of the split sphincter.

When there is no anus and the rectum connects with the anal site by a fibrous cord or ends above it in a blind pouch (Fig. 130), a more serious operation, *proctoplasty*, is required. Under such circumstances a lengthy incision extending from the perineum in front backward almost to the coccyx (Fig. 131) is necessary to provide room for dissections which must be carried upward for a considerable distance to the rectal termination.

When the distended bowel has been reached it is loosened



on all sides, brought down, opened (Fig. 131), drained, cleansed, and sutured to the skin of the anal region inside the muscular ring (Figs. 131, 132).

Excision of the coccyx is sometimes necessary to provide additional room for dissection, and occasionally, where the rectum

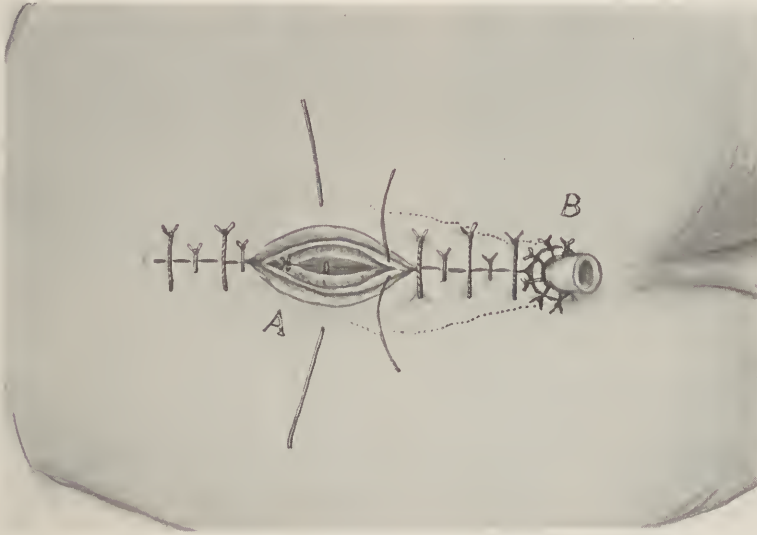


Fig. 132.—Author's operation for imperforate anus where the rectum ended in a blind pouch. Second step: After a drainage-tube has been introduced (A) the wound is closed with deep superficial and retention sutures; B, the rectum is stitched to the perianal skin.

cannot be brought down sufficiently, the establishment of a coccygeal or sacral anus becomes imperative.

#### MALFORMATIONS OF THE RECTUM—ATRESIA RECTI, IMPERFORATE RECTUM

Congenital defects of the rectum are rarely suspected until dangerous manifestations arise because the anus is normal. When a diagnosis cannot be made by palpation, percussion, digital examination, or proctoscopic inspection, laparotomy is indicated to clear the diagnosis and relieve obstruction.

There are several types of congenital anomalies of the rectum, viz.: *total absence, termination of the rectum a short or considerable distance above the anus* (Fig. 134), *membranous obstruction of the rectum* (Fig. 124), *communication between the deformed bowel and another viscus by a fistula, and opening into urethra, ureter, bladder, uterus, or vagina.*

**Total Absence of the Rectum.**—A few cases of complete obliteration of the rectum, alone or with a colonic segment, have been recorded; but usually external evidences of the defect are lacking.

Infants thus afflicted often die before the anomaly is discovered and corrected.

*Treatment.*—Proctoplasty and suturing the rectum at the anal site is impossible, and a controllable artificial anus (Fig. 145) is established in the left inguinal region, or higher when a colonic segment is malformed. In this class of cases the colostomy opening is permanent and care is taken to make it effective.

**Termination of the Rectum at a Short or Considerable Distance Above the Anus.**—Here there is a developmental error, in consequence of which the rectum ends in a blind pouch or funnel-shaped fibrous tube or stalk-like extension (Fig. 130), at a point anywhere from a few lines to 3 inches (7.62 cm.) above the anus. Tissue intervening between the anal outlet may be membranous, dense and thick, or cord-like; but 3 cases have been recorded where the rectum was connected to the anal canal by a mucous tract.

*Diagnosis.*—Owing to normal appearance of the anus the defect is seldom recognized early, or before constipation, nausea, fecal vomiting, straining, and marked

meteorism point to obstruction. Introduction of the finger or small proctoscope enables one to locate and define the character of the anomaly, and a trocar or aspirating needle is not employed except as a last resort, because death from peritonitis has followed their introduction.

*Treatment.*—When feasible the sphincter is preserved and



Fig. 133.—Atresia of rectum in child that died on sixth day (Army Medical Museum).

the anus left at the normal site, which is easy when the rectum is separated from the latter by only a membranous obstruction.

When the gut terminates a short or considerable distance above the anus the blind end of the rectum is reached, freed, drawn down, opened, cleansed, and sutured in the anal or perineal region (Figs. 131, 132), following excision of mucous membrane lining the anus. Occasionally removal of the coccyx and formation of a vent in the sacrococcygeal region is advisable to make room for dissection and prevent tension and sloughing that would follow were the gut sutured to the skin about the anus.

Because of the disagreeable features and high mortality of the operation *colostomy* is not advisable except when the malformation cannot be relieved by proctoplasty and it is necessary to relieve immediately urgent symptoms of acute obstruction.



Fig. 134.—Imperforate rectum caused by membranous partition, the anus being normal.

**Membranous Obstruction of the Rectum.**—This represents the most harmless type of rectal anomalies, yet symptoms and diagnostic signs of the condition are about the same as for other anorectal defects that completely occlude the bowel.

*Treatment.*—When the obstructing fibrous membrane or diaphragm (Fig. 137) is situated low down (Fig. 134) or below peritoneal attachment, it is ruptured with the finger or incised at one or more points and caught with forceps and trimmed off with knife or scissors (Figs. 135, 136). Subsequently the rectum is dilated with the finger.

High obstructions have been relieved by puncturing and draining the rectum with a trocar, but the procedure is unsafe and the establishment of an artificial anus is preferable. Later, when the child has sufficient strength to withstand a major operation, the defect may be corrected by proctoplasty and the artificial anus closed.

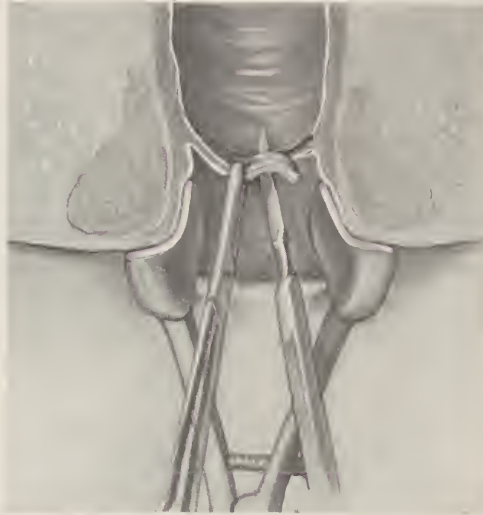


Fig. 135.—Author's operation for imperforate rectum caused by membranous partition in a case where the anus was normal. First step: Membranous partition excised with forceps and bistoury by an incision that encircled the rectum.

**Rectum Opening into Another Organ Where the Anus is Normal or Absent.**—Communication between rectum, bladder, urethra, ureters, vagina, perineal or sacral region is fairly common

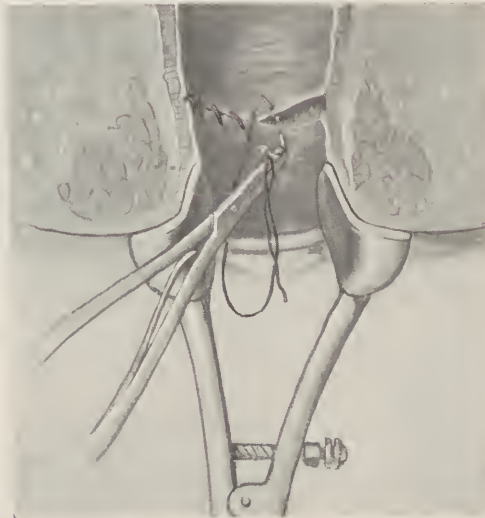


Fig. 136.—Author's operation for imperforate rectum caused by membranous partition in a case where the anus was normal. Second step: Circular wound edges approximated with chromic gut, following which a drain is inserted anteriorly and posteriorly.





Fig. 137.—Excision of membrane causing congenital stricture of the rectum.

when the anus is either normal or absent. The connection may take place through a fistula, large opening, or a functioning anus



Fig. 138.—Membranous partition partially occluding the rectum being removed with scissors.

surrounded by a rudimentary or normal sphincter. The false outlet may be *small*, and lead to obstruction, *medium*, and cause

constipation, or *large*, and interfere slightly or not at all with defecation.

Rectal malformations of this class are encountered in females more frequently than males, and the bowel opens into the vagina more often than other organs.

**Atresia Ani Vaginalis.**—In this type of congenital defect the vaginal opening is usually sufficiently large to permit free evacuations independent of or with the aid of laxatives to soften or liquefy feces, and in several instances young girls and women thus afflicted did not realize they were deformed.

Usually the opening in the rectovaginal septum is low (Fig. 139), but may be high, and in exceptional instances the vent has been encountered in the vulvar region or space intervening between

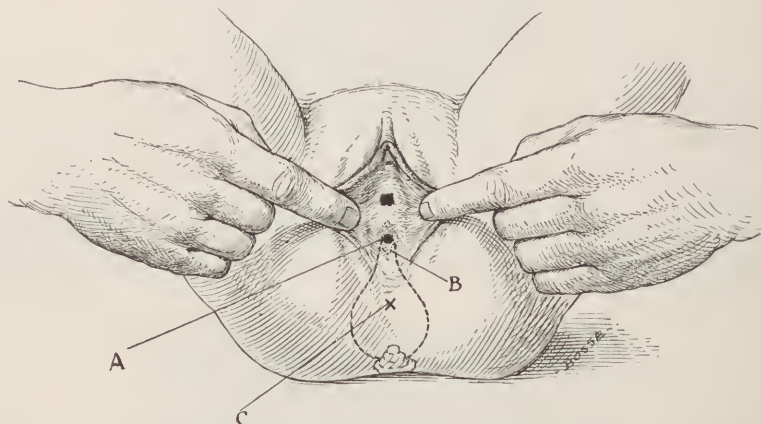


Fig. 139.—Imperforate anus, the rectum (A) terminating in the vagina; B, sphincter surrounding the vaginal opening; C, normal site of the anus.

it and the anus. Where the opening is normal in size and location the rectum is seldom deformed; but when the anus is absent the lower bowel connecting with a false passage is nearly always dilated.

Infants and children afflicted with atresia ani vaginalis seldom die or suffer greatly from chronic intestinal obstruction owing to the large size of the rectovaginal communication.

**Treatment.**—There is no hurry for surgical interference unless manifestations of acute obstruction develop early, and the operation must be varied to meet indications in this type of congenital defect. Proctoplasty is best postponed until prepubescence, and in the meantime the fistulous opening or misplaced anus must be frequently dilated to forestall constipation, fecal impaction, and auto-intoxication.

Where the anus is absent and the rectum bends forward terminating in the vaginal septum the deformity is corrected by an operation comprising the following steps:

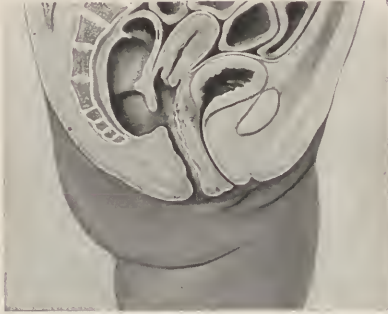


Fig. 140.—Imperforate anus, the rectum opening into the vagina, the sphincter being at the usual anal site.

*First Step.*—Through an incision extending from the introitus vaginæ to the coccyx dissections are carried upward and about the



Fig. 141.—Author's operation for imperforate anus where the rectal opening in the vagina is surrounded by the sphincter. First step: Lines of incision and preliminary dissections.

rectum, until it has been freed except at the vaginal attachment (Fig. 141).

*Second Step.*—The vaginal opening or anus—including the sphincter if present—is freed by an elliptic incision and the bowel drawn backward into the original wound (Fig. 142).

*Third Step.*—Rectum and attached sphincter are sutured to the skin at the normal anal site or in front of the coccyx (Fig. 142).

*Fourth Step.*—Remainder of the wound is closed with deep interrupted plain and chromicized catgut stitches (Fig. 142) and the suture line drained and protected by suitable dressings.

Sometimes the rectum is normal, but the anal canal is stricture, and feces are voided through it and the vaginal fistula.



Fig. 142.—Author's operation for imperforate anus where the rectal opening in the vagina is surrounded by the sphincter. Second step: Freed rectum, sphincter, and skin-flap drawn downward, backward, and sutured to skin at the normal anal site, following which the wound is closed and a tube introduced into the rectum.

In such cases good results are obtained by proctotomy and dissecting the fistula out, following which the vagina is sutured, and the rectal wound is drained and allowed to heal by granulation. Subsequent to this procedure the finger is occasionally passed into the rectum to prevent the formation of stricture.

**Atresia Ani Vesicalis.**—The rectum may open into the male or female bladder by a mucous channel through which urine empties into the rectum, and meconium, feces, and flatus escape into the bladder, where they may remain to be voided by way of the urethra. Proctitis and cystitis are frequent complications of



this deformity, and a *diagnosis* is made upon the finding of urine in feces or fecal matter in the urine.

*Treatment.*—Early operation is indicated to forestall cystitis and ascending infection of the ureters and kidneys, which is fatal, and to prevent acute obstruction when the anus is abnormal. Infants seldom withstand radical operation necessary in these cases, and *colostomy* (Fig. 145) is preferable, since it requires but a few moments and lessens the danger from vesical and renal infection by keeping fecal matter from the bladder.

In a few weeks the rectum becomes accustomed to urine, and the buttocks can be protected against excoriation by greasing them with zinc oxid ointment. Later, when the child is sufficiently strong, the rectum is dissected free and sutured in the anal region and the fistulous opening allowed to close spontaneously.



Fig. 143.—Imperforate anus, the rectum terminating in the bladder.



Fig. 144.—Imperforate anus, the rectum opening through the glans penis.

Where the rectovesical opening is high, colostomy (Fig. 145) is performed; later the abdomen is opened, the rectum and bladder are carefully separated by dissection, and openings in each are freshened and sutured; after the abdominal wound has been closed the rectum is anchored in the perineal region, following the plan of Amussat. Weeks or months later, when the child is stronger and has normal daily evacuations through the anus, the colostomy opening may be closed.

**Atresia Ani Urethralis.**—Malformations of this type are usually encountered in males, and the fistulous opening may involve the urethra at any point, but is usually located in the membranous portion; the opening is usually small.

Cases have been recorded of infants, children, and adults who voided feces or defecated through the penis (Fig. 144) for months or years, but such favorable instances are rare.

*Diagnosis.*—Deformities of this class are differentiated from atresia ani vesicalis by the absence of cystitis, nephritis, and frequent micturition, and by the voiding of meconium, flatus, and feces through the meatus independent of urination.

*Treatment.*—Surgical intervention is not always urgent, because while there may be a urethritis, dangerous manifestations of infection, such as cystitis, pyelitis, and nephritis, are lacking, and symptoms of obstruction are not serious. In this case the rectal pouch is usually located a short distance above the anus, which enables the operator to readily dissect the bowel from its attach-

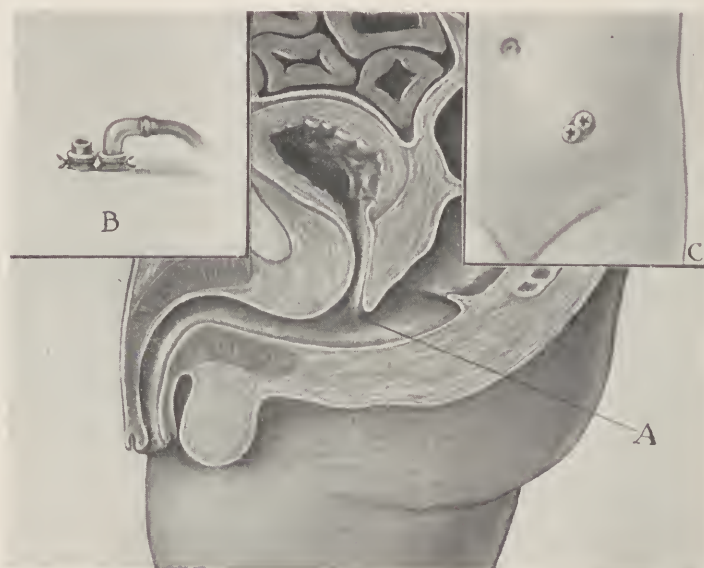


Fig. 145.—Imperforate anus (A), the rectum terminating in the urethra. Plastic operation being impracticable owing to the infant's age, B, colostomy was performed and drainage established with aid of a Paul tube; C, appearance of the artificial anus six weeks following operation.

ments behind, at the sides, and from the urethra, bring it down, and attach it to the anal or perianal skin.

Occasionally the urethral aperture is sutured, but when this is not feasible it is left to close spontaneously. In deplorable instances, when the infant is in a dangerous state from obstruction and proctoplasty is inadvisable, an artificial anus (Fig. 145) is immediately established.

**Atresia Ani Uterinæ.**—This constitutes the rarest type of rectal malformation with fistula, and the communication is usually through the cervix and rarely if ever by way of the fundus.

*Treatment.*—When the bowel cannot be freed and anchored at the anal site, an artificial anus is formed in the median line or side, leaving time to determine whether or not a second operation is indicated.

**Connection Between the Normal Bowel and Other Organs.**—A few cases have been reported where the rectum and anus were normal, but the vagina, uterus, or ureter opened into them. Where

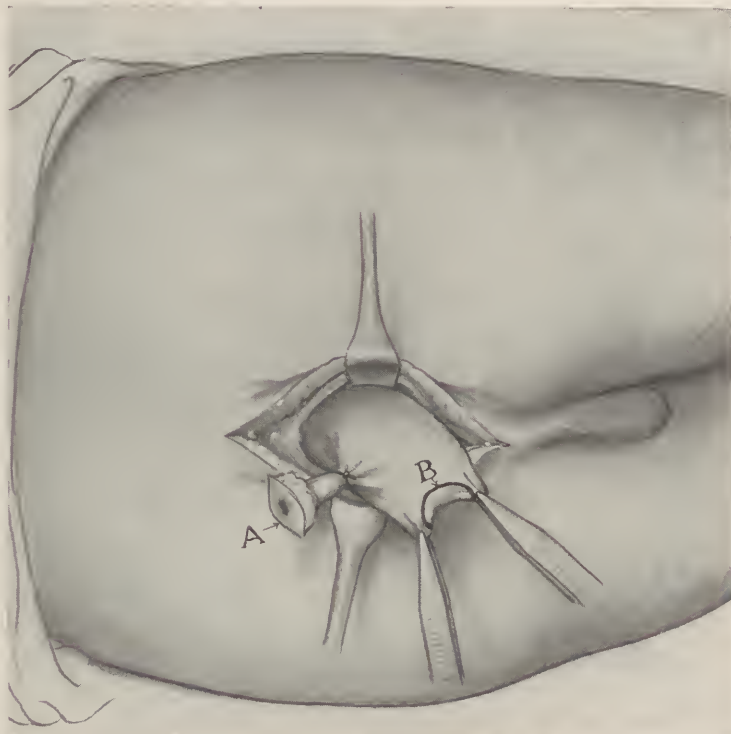


Fig. 146.—Author's operation for imperforate anus where the rectum opened upon the surface at the end of the sacrum in a case where the coccyx was congenitally absent and the sphincter was located at the normal site. First step: The rectum and (A) stoma were dissected free through a posterior median incision that split the sphincter, following which (B) the bowel was opened.

communication was with the ureter the bladder is absent, and the rectum performed a double function. In this class of cases plastic operations are usually impracticable and infants are best left alone, since the bowel accustoms itself to the urine; ascending uretero-renal infection may occur.

Vaginal fistulous openings are more often encountered, and they may be obliterated through freshening the edges and suturing

the wound, but early operative interference is not always necessary, or if so, required immediately.

**Opening of the Rectum Upon the Surface.**—Not infrequently the bowel contents are discharged through an opening located in skin of the perineum, sacrococcygeal region (Fig. 146), or scrotum. When the outlet is large, fairly satisfactory movements prevail,

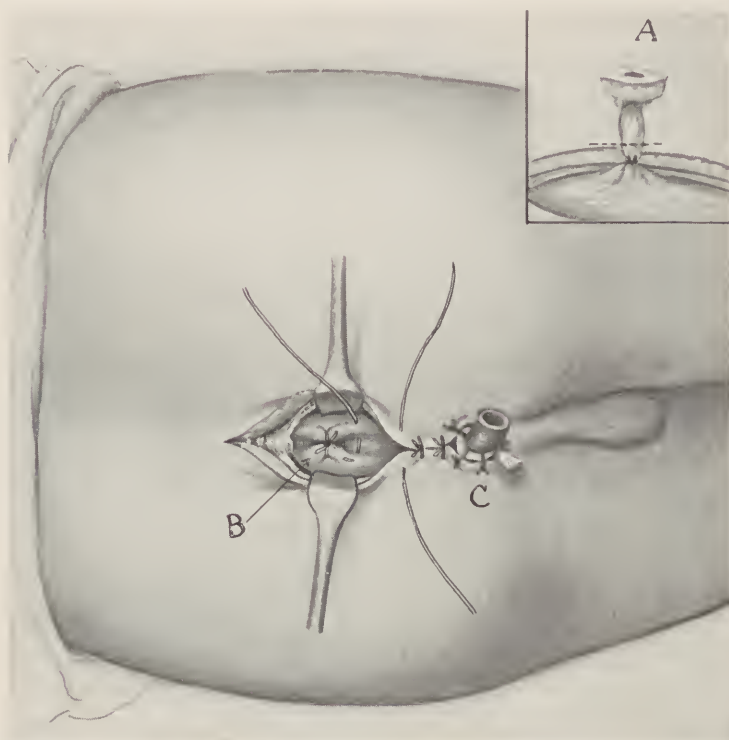


Fig. 147.—Author's operation for imperforate anus where the rectum opened upon the surface at the end of the sacrum in a case where the coccyx was congenitally absent and the sphincter was at the normal site. Second step: The ligated fistula (*A*) is excised, stump inverted, and (*B*) the bowel closed over it. The rectum is drawn down and sutured (*C*) to the skin in the anal region after the split sphincter has been approximated about it and the wound closed by deep and superficial stitches.

and early operative interference is contraindicated; but when the opening is small, meconium, gas, and feces are retained and dangerous manifestations of obstruction are present; relief is to be had by enlarging the vent or freeing the blind end of the rectum (Fig. 146) and suturing it to the anal site, after the fistulous tract has been dissected out; the wound is then closed and drained (Fig. 147). Mucus-lined fistulae sometimes atrophy and become obliterated spontaneously when the rectum is detached from them.



When an abnormal anus is located on the buttock, abdomen, or anywhere a considerable distance from the normal anal site, the deformity is corrected by *plastic operation* if feasible; if not, *colostomy* is performed to prevent acute obstruction when this impends.

**Postoperative Treatment.**—Careful handling of the patient subsequent to operations made for the relief of anorectal anomalies is important. When cleanliness and drainage are neglected, infection ensues which may terminate in death from peritonitis or exhaustion.

Following proctoplasty there is usually a tendency of the anus or rectum to contract, and unless the finger or dilator is introduced occasionally the bowel will become strictured, which causes great annoyance if not actual obstruction.

The author has operated more often for postoperative abscess, fistula, and rectal stenosis due to surgical intervention in cases of anorectal anomalies than to correct congenital anorectal defects in the newborn.

Frequently indurated anal rings and obstructing dense tissue in the rectum are gradually absorbed when the rectal outlet is kept open by divulsion, and quite often the child gains control over the movements in cases where, in the beginning, sphincteric control was lacking.

**Prognosis.**—The prognosis is favorable when the defect consists in narrowing of the anal canal or blocking of the anus by a band or membrane; bad, when the rectum is obliterated, terminates a considerable distance above the anus, or empties into the urethra or bladder, and when the anomaly is associated with other incurable malformations.

Improved technic has lowered the mortality of proctoplasty and colostomy in this class of case.

The *mortality* of *unoperated* and *operated* cases and *types of operations* required in the correction of anorectal deformities are fairly well indicated in the accompanying tables arranged by Brenner (page 152).

## 152 DISEASES OF THE ANUS, RECTUM, AND COLON

OPERABILITY AND MORTALITY OF OPERATIONS PERFORMED FOR  
ATRESIA ANI AND RECTI

Types.	Cases.	Male.	Female.	Not stated.	Operated.	Successful.	Died (causes).		Unoperated.	Surgical mortality per cent.
							Surgical.	Non-surgical.		
Atresia ani. . . . .	27	17	6	4	27	17	5	5	0	22.7
Atresia ani, vulvar outlet. . . . .	10	0	10	0	4	4	0	0	6	0
Atresia ani, complete <i>occlusion</i> . . . . .	3	2	1	0	2	2	0	0	1 <sup>1</sup>	0
Atresia ani, perineal outlet. . . . .	2	1	1	0	1	1	0	0	1 <sup>2</sup>	0
Atresia ani, scrotal outlet. . . . .	2	2	0	0	2	2	0	0	0	0
Atresia recti. . . . .	12	9	1	2	11	3	4	4	1 <sup>1</sup>	57.1
Atresia recti, vaginal outlet. . . . .	3	0	3	0	3	2	0	1	0	0
Atresia recti, urethral outlet. . . . .	2	1	1	0	2	0	2	0	0	100
Totals. . . . .	61	32	23	6	52	31	11	10	9	26.2

<sup>1</sup> Died.<sup>2</sup> Refused operation.TYPES AND MORTALITY OF OPERATIONS PERFORMED FOR ANORECTAL  
ANOMALIES

Operation.	Cases.	Successful.	Died (causes).		Surgical mortality, per cent.
			Surgical.	Non-surgical.	
Perineoplasty (mostly proctoplasties). . . . .	29	19	6	4	24
Inguinal colostomy. . . . .	11	2	4	5	66.6
Perineal dissection for fistulous openings. . . . .	10	9	0	1	0
Celiotomy and proctoplasty. . . . .	2	1	1	0	50
Totals. . . . .	52	31	11	10	26.2

The comparative *mortality* of *proctoplasty* and *colostomy* based upon collected cases made by Andrews, Curling, Cripps, and Tuttle is shown in the table on page 153.

The author's experience with proctoplasty and colostomy indicates that the mortality, as shown by statistics of these procedures, is considerably higher than it ought to be, due probably to long-drawn-out operations and employment of *general* in cases operable under *local* anesthesia.

# MALFORMATIONS—ANOMALIES OF ANUS AND RECTUM 153

## MORTALITY FROM DIFFERENT OPERATIONS FOR IMPERFORATE ANUS

	Andrews.	Curling.	Cripps.	Tuttle.
Colostomy, primary.....	52.3 per cent.	47.6 per cent.	68.4 per cent.	43.7 per cent. (32 cases)
Colostomy, secondary— <i>i.</i> <i>e.</i> , after proctoplasty has been attempted....	.....	.....	.....	45.2 per cent. (42 cases)
Proctoplasty.....	30.5 per cent.	39.3 per cent.	32.7 per cent.	
Proctoplasty, omitting atresia ani vaginalis....	38.2 per cent.	.....	40.4 per cent.	39.3 per cent. (66 cases)
Total cases.....	67	100	.....	140

## Chapter VIII

### Spina Bifida

SPINA bifida, or hernial protrusion of the canal contents through openings in the vertebral arches (Fig. 148), is a distressing congenital anomaly.

Tumors of this class are covered by one or more spinal membranes besides the skin, and contain cerebrospinal fluid alone (rarely) or with the cord and nerve elements. The enlargement may be located behind or in front of the spine, but is posterior in approximately 95 per cent. of cases.



Fig. 148.—Myelomeningocele. Changed cord tissue forms part of the wall of the sac (Elsberg).

*Cervical* and *dorsal* are rare, *lumbar* is occasionally encountered, but *sacral* or *lumbosacral* spina bifida is comparatively frequent. Spina bifida occulta may be imperceptible or vary from pea to olive size or larger, but in other forms of bifida tumors range from an egg to a child's head size.

Usually the membranes and overlying skin are thin and the tumor is pliable and fluctuating, varying in tension; exceptionally



the swelling is encompassed by a sort of fibrous sheath, and in some cases of spina bifida occulta the neck of the tumor is surrounded by a thick cellar-like covering of hair.

The *etiopathology* of some forms of spina bifida is not understood. Some authorities claim the malformation is due to arrested development of the bony covering overlying the cord; others, that it is consequent upon excessive intradural pressure, which prevents approximation of mesoblastic plates and rudimentary laminae, which results in the leaving of a spinal gap through the absence of neural arches and vertebral spines, and a hernia develops.

Pressure upon the tumor and crying swells the fontanels and increases tumor tension. Spina bifida readily undergoes changes that terminate fatally within a few weeks in most instances; from pressure necrosis the swelling may ulcerate before or after birth and infection follow. Once inflammation sets in, with the continuity of skin broken, the integument is reddened and edges of the wound are raised, indurated and sensitive, an ulcer forms with or without meningeal infection.

The sac may rupture extensively and a large amount of fluid quickly escape, or the latter may gradually dribble through a pin-point or larger size opening, and inflammation may extend from without to the spinal membranes or brain, causing meningitis, with convulsions and other serious to fatal complications.

Spina bifida is congenital and often associated with *hydrocephalus*, but the latter is rarely manifest until the child is two or three months old. Occasionally hydrocephalus and swelling of the fontanels are not observed until following radical operation.

Other congenital anomalies, such as club-foot, hare-lip and cleft-palate, dislocation of the hip, exstrophy of bladder, nerve symptoms, such as paralysis of the legs, incontinence of the rectal and vesical sphincters, are frequently associated with spina bifida; some of these are congenital, others acquired, the result of abnormality of the spine, cord, or nerves from pressure; atrophy of nerve branches is a common manifestation of the condition.

There are several varieties of spina bifida—*meningocele* (rare), *myelomeningocele*, *spinal meningocele*, *syringomyelocele*, *anterior spina bifida occulta*, and *rachischisis*.

Myelomeningocele represents 80 per cent.; spinal meningocele, 10 per cent., and other types, 10 per cent. of spina bifida cases.

**Spinal meningocele** is considered the simplest form of spina bifida because the bone covering is small; the sac containing fluid is lined with cord membranes only, the cord and nerve roots re-

maintaining in their normal position, the membranes alone protruding through the hiatus usually located in the lumbosacral region.

**Myelomeningocele** (Fig. 149) is characterized by protrusion of the membranes and nerves, which in the beginning or later is complicated by paralysis of the leg muscles, club-foot, incontinence, or trophic ulceration.



Fig. 149.—Myelomeningocele of upper sacral region. Seen at two months of age there was weakness, though no paralysis of legs, but incontinence of urine and feces. Operation at two months. Walked and talked at eighteen months. Rectal incontinence cured in six months. Urinary disturbance has persisted in lessening degree to the present time (Norman Sharpe).

**Syringomyelocele** is very rare and serious, for here membranes plus cord and its nerves extrude.

**Anterior spina bifida** is unusual, encountered in the sacral region and the hernia escapes between halves of vertebral bodies, the result of non-approximation or through intervertebral foramen.

Such tumors have been detected in the abdomen, pelvis, or postrectal space, but their discovery avails nothing, because when operated patients die.

**Spina bifida occulta**, common in the lumbosacral region, results from a small cleft in the bone and is seldom recognized, since there is not enough protrusion to cause bulging of the skin, as the tumor may not be larger than a pea or olive. Occasionally overlying skin is contracted into a dimple, thick and ridge-like, or projects outward to form a small pedunculated tumor.

**Trichosis**, or bands of hair, frequently encircle the tumor when it projects outward, or its site when no projection shows.

Lipomata, skin polyps, club-foot, hare-lip, hip-joint luxation, web-fingers, sacrococcygeal tumors, and cleft-palate are frequently observed in connection with this type of spina bifida.

**Rachischisis** is characterized by an open central canal extending for a short or longer distance, in consequence of which the cord is left spread out and exposed. Infants thus afflicted are usually stillborn or die in a few hours or days.

## SYMPTOMS

The manifestations of spina bifida may be few, and of these the most important are partial or complete paralysis of the legs, anesthesia, incontinence of urine and feces, trophic disturbances, club-foot, protrusion of fontanels when the child cries, tumor in the lumbosacral region, and thinning, inflammation, or ulceration of the skin covering the tumor.

## DIAGNOSIS

The recognition of operable spina bifida is usually easy and based upon enumerated manifestations, a fluid-filled tumor over the spine—lumbosacral region—and maybe associated deformities, club-foot, cleft-palate, or vesical exstrophy, etc.

Spina bifida *occulta* is rarely recognized because the tumor is small and seldom protrudes, and anterior spina bifida frequently goes unnoticed because the swelling is located on the anterior surface of the spine. Spina bifida must be differentiated from sacrococcygeal tumors, lipomata, and ischiatic hernia.

## PROGNOSIS

The outcome in spina bifida containing nerve elements is unsatisfactory because the mortality following operative interference is high and end-results disappointing, except in pure meningocele, where the operation is easier, no nerves are involved, and prognosis better.

When not removed surgically, the skin and tumor mass become inflamed, ulcerated and infected, and meningitis ensues or the sac ruptures; urinary or fecal sepsis may follow.

Operative mortality is decidedly better in children over five, but surgical intervention terminates fatally in most instances when the operation is performed on infants, and where spina bifida is complicated by paralysis, hydrocephalus, and nerve pressure symptoms.

## TREATMENT

Formerly spina bifida sacs were treated with Morton's solution—iodin—but the practice was bad, since fluid sometimes enters the central canal of the cord and rupture of the pouch has resulted. Treatment by *aspiration* has also been discarded.

**Radical operation** (Fig. 150) gives best results, though the mortality, primary and secondary, is high, particularly in children under five, and especially when spina bifida is complicated by leg

paralysis and vesical or fecal incontinence. Hydrocephalus and abdominal or vesical fistulæ make the case more unfavorable, but should not deter one from operating.

Steps in the operation are varied to meet indications, but in most instances the sac is removed after the following plan:

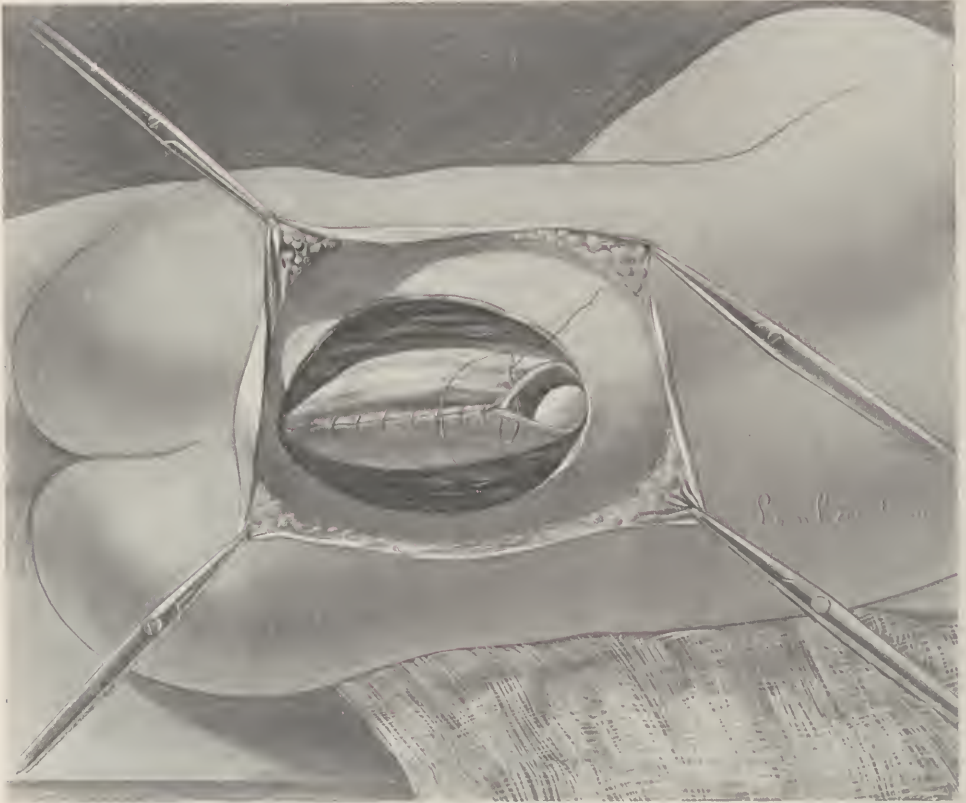


Fig. 150.—Plastic operation for spina bifida. Edges of inverted fascial flaps sewn together (Elsberg).

Having provided suitable skin-flaps, the pouch is exposed by dissections carried down to its neck or bony entrance, and opened. Medullary substance and nerves are then freed and returned to the spinal canal and the sac excised. Finally, the wound is closed by deep and superficial sutures, following the inlaying of a bone-graft when indicated.



## Chapter IX

### Sacrococcygeal Malformations—Anomalies, Injuries, Tumors, Fractures, Dislocations, and Diseases

DEFORMITIES, injuries, fractures, dislocations, neoplasms, and affections involving the *sacrum* and *os coccyx*, alone or together, have not received due consideration. Yearly many patients come to the author seeking relief from one or other of these conditions, or anorectal manifestations induced by them, and his success in the treatment of this class of cases has been gratifying, and he decided to devote a chapter to them and emphasize their importance under the following headings:

1. Sacrococcygeal malformations.
2. Sacrococcygeal injuries, fractures, and dislocations.
3. Sacrococcygeal tumors and cysts.
4. Sacrococcygeal tuberculosis, syphilis.
5. Sacrococcygeal necrosis.
6. Coccydynia.
7. Inflammation of the coccygeal body—Luschka's gland.
8. Sacrococcygeal dimples and fistulæ.

Because of the rareness and unimportance of manifestations induced by *sacral deformities* their separate discussion is unnecessary.

#### MALFORMATIONS OF THE COCCYX

Congenital defects of the *os coccyx* are common, some of which are scarcely noticeable, while others are characterized by marked distortion of the bone.

The author treated 3 patients afflicted with partial or complete absence of the coccyx (Figs. 152, 153). In 2 cases without symptoms there was a deep depression below the terminal end of the spine; in 1 the rectum terminated in an otherwise normal anus (Fig. 152),\* and in the other there was a soft bulging tumor—*proctocele*—orange size, where the coccyx should have been, in which feces collected, blocked the bowel, and caused constipation (Fig. 152).

**Deviation of the coccyx** is a common abnormality, and one or more segments or the entire bone may be bent to the right or left—lateral curvature, forward—anterior curvature (Fig. 155), or backward—posterior curvature (Fig. 154).

*Lateral deviation* is rare and does not cause annoyance, but anterior and posterior deformities are observed fairly often and induce from slight to distressing manifestations.

In *anterior curvature* (most common) the coccyx curves slightly or markedly forward against the rectum (Fig. 155), the gut is pressed against the bone during defecation and when the bowel is distended with feces. Sooner or later the patient complains of

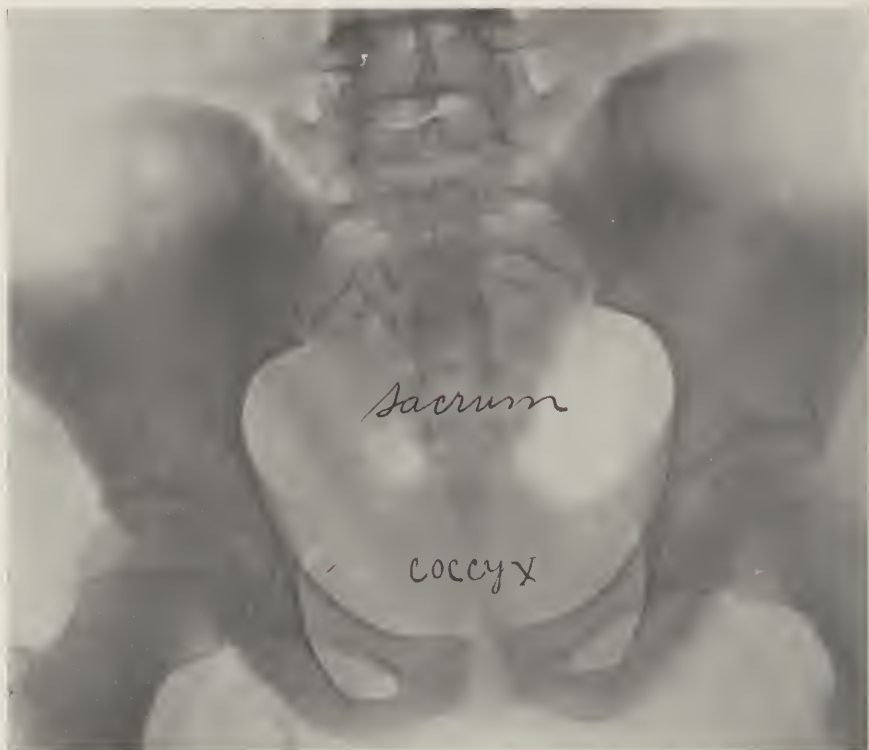


Fig. 151.—Normal sacrococcygeal and iliac regions. Radiographed at Broad Street Hospital.

discomfort or even excruciating pain, and the rectum may become ulcerated or perforated as the result of pressure necrosis.

In 12 cases of *constipation* and 3 of reflex *diarrhea* a cure promptly followed extirpation of one or more segments of offending bone. Two of the most extensive perirectal abscesses and fistula observed by the author were caused by coccygeal punctures of the rectum.

*Posterior curvature* is most frequently encountered in lean unmarried women who sit well forward to prevent the projecting

bone from coming in contact with the chair seat, which makes them uncomfortable or causes decided pain.

In this type of coccygeal deviation the bone curves slightly or sharply backward, displacing overlying structures, to form a hard, skin-covered, knob-like projection (Fig. 154). The contour of the coccyx is plainly visible in thin, and partially hidden by a cushion of fat in stouter, individuals.

Not infrequently an indurated disk-like movable swelling forms a corn or protective bursa, or both (Fig. 543), directly over the coccygeal tip. The author has twice removed *corns* located at this point (Fig. 542) from tailors who sat on the floor while sewing. These painful, ulcerating, horny excrescences had previously been diagnosed as *epitheliomata*, but both patients were promptly cured by excising the growths under local anesthesia.

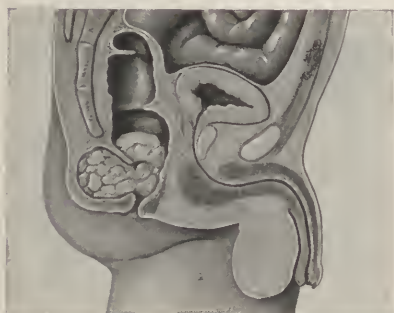


Fig. 152.—Posterior rectocele resulting from congenital absence of the coccyx distended with hardened feces.



Fig. 153.—Congenital absence of the coccyx with anus located at the end of the sacrum, below which point a fecal concretion is seen in the rectum.

**Symptoms.**—The manifestations of coccygeal deformities, briefly summarized, are: discomfort and pain induced by walking, sitting, arising, riding on a hard seat, or expulsion of feces. This class of sufferers are uncomfortable in bed and when hardened feces collect in the rectum, but the discomfort soon disappears when they get up and following an evacuation.

In deplorable cases where the coccygeal tip impinges against the rectum and causes ulceration; diarrhea and muscular spasms of the levator ani and sphincter muscles are troublesome and the stools contain pus or mucus. In one case an infant's scalp was severely cut by the coccyx during labor, and in a case of anterior curvature with ankylosis excision of the bone was necessary before the infant could be delivered.

**Diagnosis.**—Posterior coccygeal deviation is obvious upon inspection, and anterior curvature is easily diagnosed by eliciting the above symptoms, palpating, and by manipulating the bone

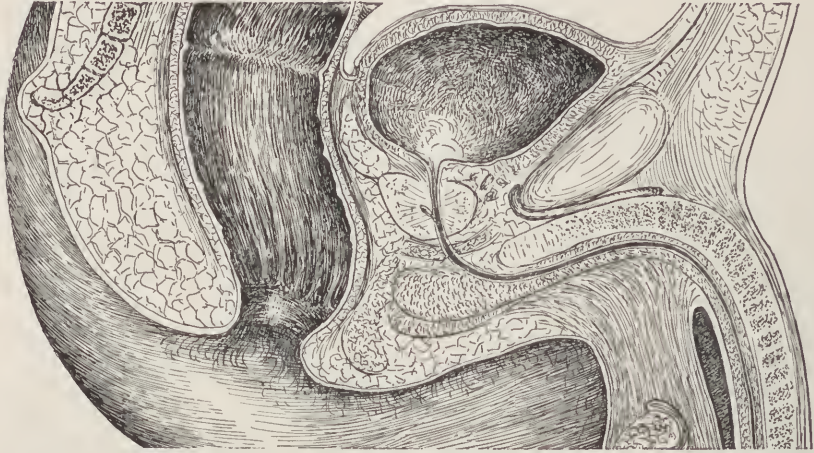


Fig. 154.—Posterior deviation of the coccyx that bulged the skin outward, making it sensitive when the patient, a tailor, assumed a sitting posture.

with a finger in the rectum and the thumb placed externally over the coccyx (Fig. 156).

**Treatment.**—Non-operative measures are useless, for nothing short of excising the coccyx or offending segment of bone relieves the patient.



Fig. 155.—Anterior deviation of the coccyx responsible for rectal ulceration and constipation.

**Surgical Treatment of Sacrococcygeal Malformations, Injuries, Fractures, Dislocations, and Coccydinia.**—Operations upon the sacrum barring curetment or plastic repair are seldom indicated, which is fortunate, since removal of sacral vertebra is dangerous and often followed by paralysis or loss of pelvic support.



Two widely different procedures have been suggested in the curative treatment of coccydynia and other painful abnormalities, fracture, dislocation, and deviation of the coccyx:

1. Excision—coccygectomy.
2. Subcutaneous tenotomy.

**Coccygectomy.**—Excision of the coccyx or its segments is the operation of choice in the treatment of coccydynia, deformities,

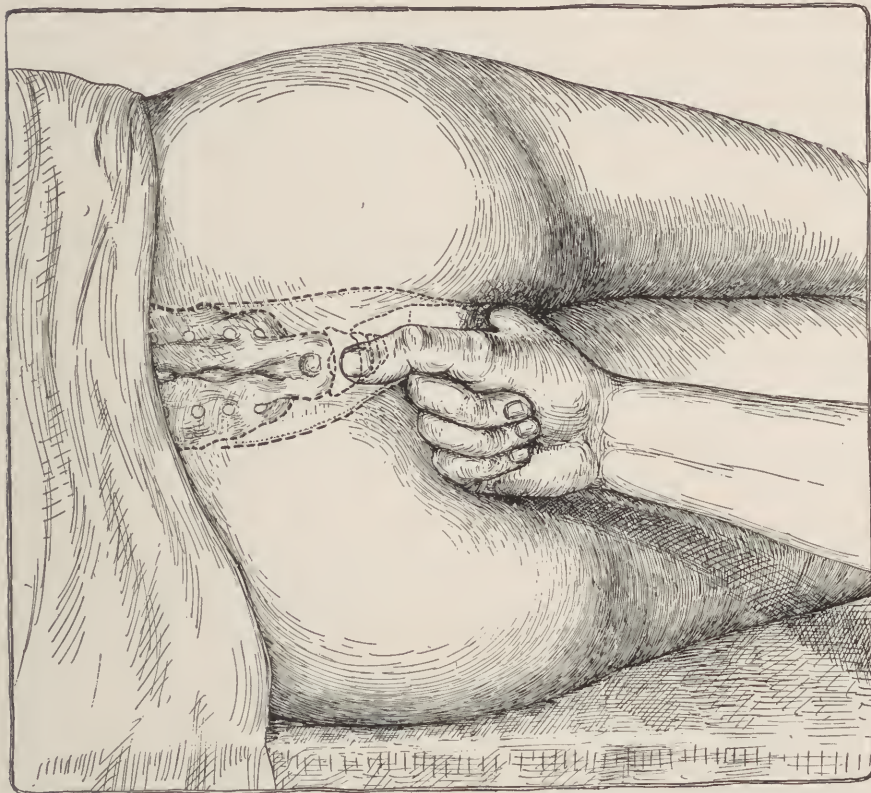


Fig. 156.—Method of examining the coccyx when injured or diseased with finger in the rectum and thumb over the bone.

fracture, and dislocation of the bone. Some surgeons defer performing coccygectomy because they have been taught the operation aggravates instead of relieving the patient's suffering.

The author's experience with the procedure has been gratifying, and he has never known coccydynia to be made worse through removal of the diseased or offending bone.

A study of the table on page 177 and additional cases treated by the author will give the reader an idea as to what may be expected from coccygeal excision.

*Author's Coccygectomy—Excision.*—This procedure is attractive because it is performed in three minutes under local or gas anesthesia, is practically bloodless, and requisites are: a pair of strong blunt scissors, author's large curved needle and coccygectomy elevator (Fig. 158), and a strand of No. 2 chromicized catgut.

*First Step.*—After having been folded transversely with the fingers, the skin and subcutaneous structures are incised with scissors, exposing the bone (Fig. 157).

*Second Step.*—The tip of the coccyx is hooked up with the author's coccygeal elevator (Fig. 158) and freed at the end anteriorly, posteriorly, and laterally by five bold scissors' cuts.

*Third Step.*—Offending segments of the coccyx are extirpated with one right-angle cut made with the author's blunt scissors (Fig. 157).

*Fourth Step.*—The inch-long wound is closed by introducing and tying three deeply placed chromicized gut sutures and applying dressings.

In this procedure a drain is unnecessary and primary union obtains, since there is practically no subsequent bleeding or blood-clots left to become infected.

*Hemorrhage* is avoided by directing the scissors outward at all times, to avoid injuring branches of the hemorrhoidal and middle sacral arteries coursing along the posterior surface of the rectum.

**Nott's excision** is a tedious operation, necessitating a drain, and is frequently complicated by hematoma, infection, and a lengthy convalescence the result of injuring blood-vessels on the posterior surface of the rectum, bleeding from which prevents complete closure of the wound or leads to the formation of blood-clots that become infected and cause trouble when the wound is sutured.

Following the author's coccygectomy patients are permitted a regular diet and confined to bed from five to eight days.

**Subcutaneous Tenotomy.**—Pain and discomfort from deformities, coccygeal diseases, and spasms of the sphincter or levator ani muscle attached to the coccygeal tip are occasionally temporarily or permanently relieved by the author's *subcutaneous tenotomy* performed under general or local anesthesia. The operation does not permanently eliminate suffering caused by displacement, fracture, or necrosis of the bone.

When performing subcutaneous tenotomy the author, after infiltrating tissues with eucain, makes a buttonhole incision below the tip and severs offending muscles and tendons from the coccyx

by quick strokes made with knife or scissors, following which the wound is closed with a single chromic gut suture.

The operation is painless, requires only five minutes, and sometimes immediately frees the patient from sacrococcygeal pain and the tense feeling at the pelvic outlet caused by muscular spasms.

#### SACROCOCCYGEAL INJURIES, FRACTURES, AND DISLOCATIONS

The sacrum alone or with the coccyx is occasionally contused by external violence, and has in rare instances been found severely traumatized in connection with gunshot, stab, shell, or explosion wounds.

Fractures, dislocations, and injuries of the os coccyx are quite common and are usually caused by a blow, kick, fall upon the buttocks, being thrown from a horse or wagon, falling upon a blunt or sharp object, or passage of the head during parturition.

The author treated a thief whose coccyx was shot in two while attempting to escape, and has operated upon 21 cases where the bone was fractured, the result of the evacuation of enormous impacted fecal tumors, 2; labor, 5; expulsion of foreign bodies, 1; kick, 2; falling upon a paling, 2; sitting down upon a chair knob, 1; falling on ice, stairs, or stones, 6, and being thrown from a wagon during runaway, 3.

Coccygeal fracture, displacement, or complete detachment may be induced in either of the above ways.

**Symptoms.**—When injury is due to external violence the skin covering the sacrococcygeal region is reddened, ecchymosed, cut, or lacerated.

Fractures, dislocations, and injuries of the coccyx induce a heavy, dull, aching pain in this region which is aggravated by spasmodic contraction of attached muscles, walking, sitting, arising, riding, and exercising. Pressure over end of the bone produces excruciating pain sometimes reflected up the back or down the limbs; suffering is relieved by lying on the abdomen and intensified by defecation. Hemorrhage is a manifestation when the skin or hemorrhoidal vessels are injured, and gas and feces escape when the rectum has been punctured.

Improperly treated injuries often terminate in infection, ankylosis, or displacement of the bone, and formation of exudates or fibrous tissue that involve muscle tendon and joint, compress nerves, and cause coccydynia—neuralgia.

**Diagnosis.**—Fractures, dislocations, and injuries of the coccyx



are recognized by inspecting the skin, manipulating the bone (Fig. 156), examining the rectum, and obtaining a history of the accident.

**Treatment.**—Incised external wounds are sterilized and closed, internal are drained; lacerated skin edges are trimmed with scissors and fragments of bone removed.

When the coccyx is badly fractured, displaced, or detached *resection* or *complete extirpation* gives the best result because the

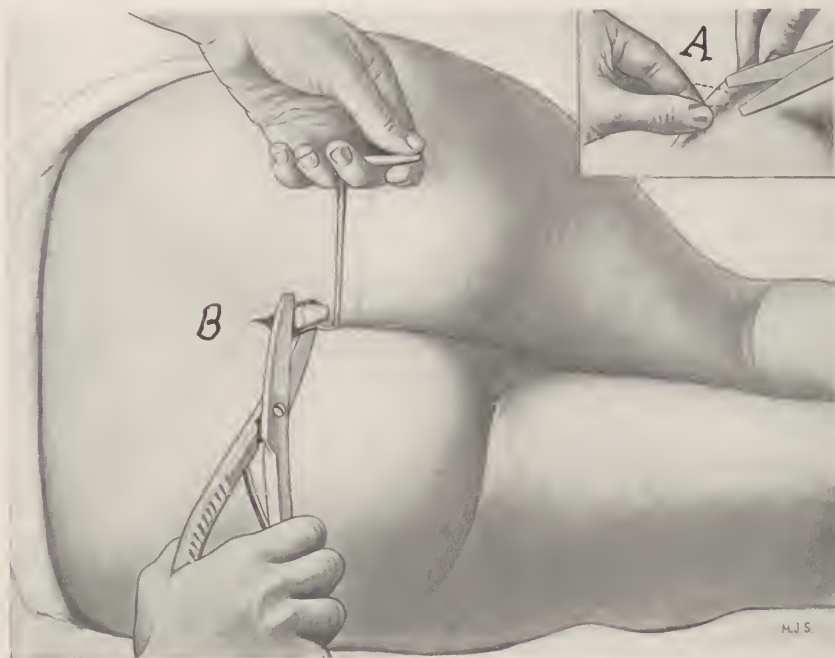


Fig. 157.—Author's bloodless coccygectomy performed with aid of his heavy blunt scissors and coccygeal hook. Following (A) incising the skin and deeper structures with a single cut of the scissors it is lifted upward with fingers (B), the coccyx is freed, exposed, and removed by four rapid cuts made with blunt scissors.

injured bone is difficult to immobilize by splints, sutures, or in other ways, and tamponing the rectum is impracticable, for cotton or gauze soon becomes waterlogged, shrinks up, or prevents escape of gas and feces.

The author obtained a good result by inserting the finger into the rectum and replacing the fractured coccyx; a needle threaded with iodized gut was then passed through the skin and made to catch up overlying tendinous coccygeal attachments, after which it was brought out near the point of entrance and tied



across a gauze pad. Pain was immediately relieved and a cure brought about in two weeks.

Occasionally properly adjusted adhesive straps give a sense of support and lessen suffering.



Fig. 158.—Author's coccygectomy hook.

When surgical intervention is declined, strapping, rest in bed, hot applications, semisolid diet, and a daily laxative do much toward keeping the patient comfortable; opiates are necessary to relieve excruciating pain during acute attacks of muscular spasm.

When *extirpation* of the coccygeal segments or *tenotomy* is indicated in the treatment of coccygeal injuries, fractures, or dislocations the operation is performed in the manner previously described.

#### SACROCOCCYGEAL TUMORS AND CYSTS

Neoplasms and cysts of the sacrococcygeal region are more common than believed by the profession. In nearly all instances they are congenital in origin, but occasionally do not degenerate and cause discomfort and complications until adult life.

Most, if not all, growths are secondary to developmental errors in the caudal end of the embryo, many having their origin in the neurenteric canal.

Sacrococcygeal tumors (Fig. 159) may be elongated, spheroidal, lobulated, or pedunculated in form, varying in size from a pea to that of a child's head, located upon the anterior or posterior surface of the sacrum and coccyx (Fig. 160), though the latter is usually the point of election; single or multiple, solid or fluctuating, sensitive or not, and vary in their structure and contents.

*Angiomata, lipomata, sarcomata, lymphangiomata, and carcinomata* here have practically the same characteristics as elsewhere.

*Spina bifida* because of its peculiarities and lack of resemblance to common forms of sacrococcygeal neoplasms has been separately discussed in Chapter VIII.

Of congenital tumors occurring here, dermoids are encountered more frequently than all other types. Braune classifies sacrococcygeal tumors as follows:

1. Coccygeal tumors proper.
2. Sacral hygromata.
3. Tail-like formations and lipomatous appendages.
4. Tumors in the adult, the congenital nature of which is not clearly proved.

Holmes groups them into: (a) Tumors assuming the forms of supernumerary limbs, the result of double fetation, (b) tumors with



Fig. 159.—Sacrococcygeal tumor that caused partial obstruction (Lord).

fibrofatty—lipomatous—constituents, where congenital origin is not apparent, (c) congenital tumors which enter the pelvis, not of fetal origin. Another authority incorporates them under the following headings: *caudal appendages, dermoid cysts, mixed tumors, and fetal inclusions*.

Because of their variety, differences in shape, consistence, contents, and etiology a grouping of these neoplasms is extremely difficult, and it is frequently impossible to diagnose them except by operation, microscopic examination, or autopsy. For these reasons the author will not attempt to classify sacrococcygeal tumors, but will point out their chief diagnostic characteristics and manifestations.

In most instances congenital tumors of this region are of sufficient size at birth to attract attention. Pitha's case, however, is an

exception, he having amputated a third leg attached to the coccyx of a young woman twenty years old, in whom there was only a slight enlargement of the coccyx at birth.

Scuttleben removed a small hand attached to the caudal bones; Mason extirpated a lymphadenoma the size of a fetal head; Hutchinson removed a tumor containing a sternum and brain substance; but one of the most interesting cases of coccygeal tumor is that of Chebbs, in which a fleshy mass 2 inches (5.08 cm.) long and  $\frac{1}{2}$  inch (1.27 cm.) in diameter projected from the spine in the end of which was an orifice connecting with a canal running the entire

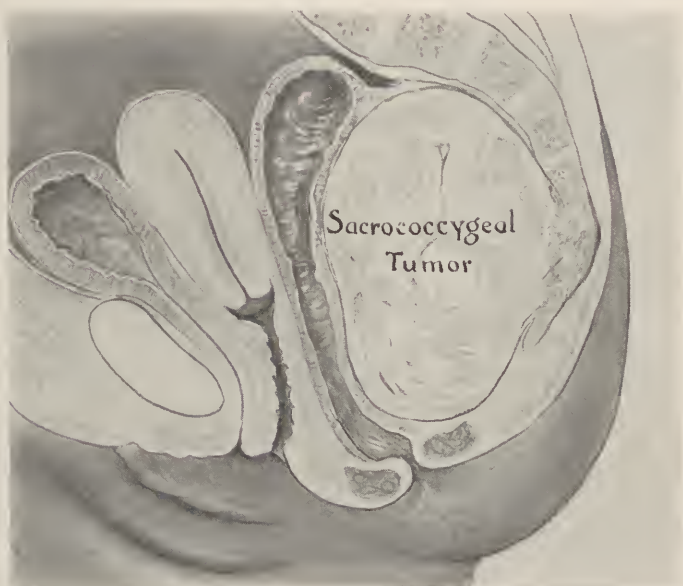


Fig. 160.—Fibrous sacrococcygeal tumor compressing the rectum that caused obstipation.

length of the growth, which resembled the penis of a boy six years old.

Three cases of caudal appendages have come under the author's observation: in one, a young adult, a third leg projected from the sacrum; in another, an irregular-shaped mass composed of flesh and bone covered by skin was an outgrowth from the same region; and in a third, a soft lipomatous growth resembling the scrotum was attached to the skin over the coccygeal tip of a boy seven years of age.

Dermoids of the sacrococcygeal region differ slightly if at all from hairy cysts in other regions. When located on the *posterior* aspect they degenerate early and terminate in infection, abscess

and fistula, or malignancy; but when situated upon the *anterior* surface of the sacrum or coccyx they often obstruct the bowel and later may slough off and be evacuated through the anus, or cause fistulæ, by means of which they escape through the perineum or elsewhere.

*Dermoid cysts* of the anorectal and sacrococcygeal region having been fully discussed in connection with non-malignant tumors in Chapter XLVIII will not receive further consideration here.

**Symptoms.**—The manifestations incident to sacrococcygeal tumors vary with their character, size, location, variety, and extent of degeneration. Neoplasms situated on the anterior surface of the sacrum or coccyx obstruct the rectum and displace it, the anus, vulva, and vagina as they enlarge; sometimes the coccyx or sacrum is displaced backward or fractured, evidence of which is seen through the integument. The overlying skin may remain normal, assume a bluish hue, ulcerate, or slough away through pressure necrosis.

Eversion of the anus and rectal prolapse with or without uterine procidentia may be a complication owing to resulting pressure and obstruction.

Constipation, fecal impaction, hemorrhoids, fissure, ulceration of the anal mucosa are common symptoms, the result of bowel blocking and interference with the circulation; necrosis, abscess, and fistula are occasionally observed.

Owing to action of the neoplasm upon the sacrum, coccyx, and rectum spasmodic and heavy pains are felt in the lower back, bowel, or down the limbs; tumors attached to the rectum and bladder induce dragging down sensations, frequent micturition, or urinary retention.

Children afflicted with sacrococcygeal tumors complicated with spina bifida suffer from convulsions and neurogenic disturbances.

Usually where a tumor mass presses against or projects through the rectal wall there is an incessant desire to stool unrelieved by evacuation.

**Diagnosis.**—External tumors are obvious; but internal, located high up on the anterior surface of the sacrum, are frequently difficult to diagnose in infants and children, and are not suspected until they degenerate and cause secondary manifestations.

When a congenital neoplasm is suspected the abdomen and rectum are inspected and examined digitally and bimanually to ascertain if a firm swelling (Fig. 160) or fluctuating mass can be isolated, a procedure helped by having the patient cough and strain down during manipulations.



If the swelling is *spina bifida* it will be located in the anterior or posterior median line; withdrawal of its contents often is followed by convulsions, and examination of the fluid shows sugar.

Sacrococcygeal neoplasms containing supernumerary limbs are easily recognized by their size and shape, and are diagnosed as double fetation.

**Prognosis.**—Depending upon their nature and therapeutic measures adopted for their elimination, the prognosis in cases of sacrococcygeal tumors is good or bad, but usually the mortality is high, being 40 per cent. in this class of cases because operation is tedious, the spinal cord is frequently injured, and victims, usually infants and children, possess little vitality; they often survive operation and die later of hydrocephalus.

**Treatment.**—Palliative measures have no place in the treatment of sacrococcygeal tumors. Iodin and carbolic acid have been employed, but since only one case has been reported cured by the injection treatment it has been abandoned because of dangers accompanying it. *Tapping, partial resection, complete extirpation,* and the *ligature operation* have been resorted to by surgeons in their efforts to destroy sacrococcygeal neoplasms.

**Tapping.**—The withdrawal of fluid is not curative, but occasional tapping lessens tension and relieves pressure symptoms incident to inoperable tumors, except in cases of *spina bifida*, when the abstraction of fluid may be followed by convulsions, meningitis, or death.

**Partial Resection.**—Removal of a portion of the growth is sometimes justified where total extirpation may be inadvisable owing to size of the tumor, its depth, connection, or extensive attachment.

Under such circumstances as much of the neoplasm as feasible is destroyed with the cautery or ligated and excised at one or more points.

**Complete Extirpation.**—This is the procedure of choice for sacrococcygeal tumors not connected with the spinal cord, since excision is curative and followed by a lower mortality than other surgical procedures.

Following exposure of the neoplasm by a free incision it is carefully dissected from adjacent structures, organs and bone, by blunt dissection.

When the mass is cystic, precautions are taken to avoid puncturing or injuring the capsule, and if the tumor is attached by a pedicle this is traced to its origin and excised, even if dissections are carried deep into the pelvis or elsewhere.

When opened, the peritoneal cavity is closed or drained. The external wound is approximated with catgut or linen stitches; drainage is advisable when a portion of a cyst is left, the tumor is suppurating, or recurrence of the growth expected.

*Ligature Operation.*—Ligature and excision work well for growths having a narrow pedunculated attachment; but it is useless to tie off large tumors because of incident suffering and uncertainty that the mass will slough off completely.

This procedure is objectionable in most cases because ligatures are not tied sufficiently tight or cannot be adjusted high enough to destroy the entire growth.

*Supernumerary limbs* that form or project from sacrococcygeal tumors are amputated in the usual way or resected, as circumstances require. Hands, feet, and legs of considerable size have been successfully removed from infants, children, and adults without serious complications.

In 3 cases reported by Braune tumors were detached by sawing through bony stalks that extended well into the pelvis.

#### SACROCOCCYGEAL TUBERCULOSIS AND SYPHILIS

Lues and tuberculosis now and then attack the periosteal covering of the sacrum and coccyx, causing necrosis, abscess, and fistula.

Usually lesions are external and easily recognized, but when the disease involves the anterior surface of the sacrum or coccyx pain is severe, anorectal muscles spasmodically contract, and the patient suffers from chills, defecatory pain, abscess, and fistula when the region is infected.

**Treatment.**—Following removal of necrosed bone, operations upon abscesses and fistulæ, and partial closure with drainage of the wound salvarsan is administered when the patient is luetic; tuberculin, tonics, and an out-door life are prescribed when tubercular lesions involve the sacrococcygeal region, lungs, or both.

#### SACROCOCCYGEAL NECROSIS

Coccygeal necrosis ending in abscess and fistula is a common sequel to bone injuries, and not infrequently complicates syphilitic, tubercular, and malignant lesions of the sacrococcygeal region involving the periosteum.

**Symptoms and Diagnosis.**—The manifestations of bone necrosis are the same here as elsewhere. The discharge of pus through

a fistulous opening, irregular temperature, sepsis, and a grating sound produced by the probe coming in contact with the eroded surface, are the chief symptoms and indications of sacrococcygeal caries.

The external end of fistulæ associated with necrosis shows a persistent tendency to close; this retention of the discharge is followed by a chill and high temperature—symptoms immediately relieved by reopening the sinus and evacuating pus.

**Treatment.**—When a cure does not follow curettage of the necrotic area a segment or all the coccyx and a piece of the sacrum, when necessary, are excised.

#### COCCYDINIA—NEURALGIA

Coccydinia is characterized by persistent, interval, or continuous spasmodic pains located at the coccyx, in its joints, or the sacrococcygeal articulation.

Coccydinia is a persistent, distressing condition that makes the patient extremely nervous and often prevents him attending to business and social duties. Some authorities imply the ailment is incurable and others that suffering is enhanced by operative interference, opinions in which the author does not concur, because his results in this class of cases have been very satisfactory.

Coccydinia is most frequently encountered in persons between twenty and forty years of age, though it has been observed in elderly persons and children. Women are afflicted more often than men owing to their constipated habits, disturbances of menopause, and injuries to the coccyx during labor, and the lean suffer from the condition with greater frequency than the stout, because in the latter the caudal bone is protected from injury by a cushion of fat.

**Etiopathology.**—Coccydinia has been induced by exposure, sitting on damp or cold seats, toxemia, infection, functional and organic nerve diseases—neurasthenia, hysteria, tabes dorsalis—brain and spinal cord lesions, neuritis, perineuritis, anemia, climacteric and reflex disturbances resulting from abdominal, pelvic, adnexal, uterine, vaginal, vesical, prostatic, urethral, or rectal deformities, diseases or tumors, sacro-iliac abnormalities, affections of the spine or ptosis of an abdominal organ which directly or indirectly influences nerves of the sacrococcygeal region.

**Trauma** to the coccyx incident to a blow, kick, fall, horse-back riding, sitting on hard vibrating seats—engine, machine, shop, bicycle, wagon, etc.—expulsion of the child's head during

labor, pressure of impacted feces in the rectum, or suddenly sitting down on sharp or blunt objects; one of the most important etiologic factors in coccydinia and consequent pains result from injury to the periosteum, muscles, tendons, joints, and exposed nerves of the coccygeal plexus intimately connected with the central and sympathetic nerve supply of adjacent muscles and skin.

The condition has also been attributed to rheumatism, sacral or coccygeal caries, and inflammation of the periosteum or articulating surfaces.

Coccydinia is frequently associated with and caused by fissure, hemorrhoids, cryptitis, cancer, and other anorectal affections that incite contraction of muscles attached to the coccygeal tip, involve or displace the coccyx.

Coccydinia has also been induced by coccygeal dislocation, fracture, ankylosis, tumors, cysts, lues, and tuberculosis.

In the majority of the author's cases the disturbance has arisen from injuries to the bone, its muscles, joints, ligaments, or nerves, caused by passage of the child's head during labor. Trauma from this and other sources directly damage the bone, joints, nerves (inducing neuritis and perineuritis), and muscles; later nerve filaments and musculotendinous structures become involved by inflammatory exudate or fibrous tissue that keeps them constantly contracting, irritable, and modifies their function.

**Symptoms.**—In addition to distressing spasmodic pain, patients afflicted with coccydinia complain of tenderness and soreness about the coccyx on palpation, when sitting or lying down, arising, leaning forward, defecating, and riding or exercising. Suffering may be continuous, recur at short intervals, or there may not be more than one or two attacks yearly.

Dull or heavy pain confined to the coccyx or sacrococcygeal region is aggravated by coughing, sneezing, straining, anal fissure, hemorrhoids, or other lesions inducing spasmodic contraction of the sphincter, levator ani, and circumjacent muscles.

Occasionally coccydinia is accompanied by reflex pain located in the rectum, bladder, urethra, back, legs, or heel.

**Diagnosis.**—Coccydinia is seldom correctly diagnosed except by proctologists, who from experience have learned to look out for it. Unfortunately the condition frequently goes unrecognized or is wrongly treated for another affection.

Careful examination of the rectum is imperative in suspected cases, because pain simulating that of coccydinia frequently results from anorectal lesions that involve the nerves or cause irritation and spasm of anorectal and coccygeal muscles.



Due consideration must be given the urethra, bladder, prostate, kidneys, abdominal organs, uterus, spine, and sacro-iliac joints, for affections and tumors in those regions have been complicated by referred neuralgic-like pains about the coccyx, and it should be constantly kept in mind that the *location of the pain is not necessarily the seat of the disease*.

Coccygeal deformity, dislocation, fracture, or detachment is readily determined by catching and manipulating the *os coccyx* with the thumb outside and index-finger in the rectum after the manner shown in the accompanying illustration (Fig. 156); inflamed joints and tender points can be elicited by palpating and pressing the bone backward and forward.

Considerable care and ingenuity are required to differentiate between coccydynia and backache, from retroversion, sacro-iliac joint disturbances, and spinal disease.

Nerve affections, enteroptosis, anemia, and other diseases thought to have been responsible for sacrococcygeal neuralgia are to be excluded and urinary analysis must not be overlooked.

**Prognosis.**—The outcome is not good when non-operative measures are employed, but pain is permanently arrested when offending segments of bone or diseased coccygeal joints are removed.

Following excision some patients complain of pain when sitting until a cushion of fat forms over the bone stump.

**Treatment.**—Occasionally coccydynia is arrested by hot fomentations applied over the sacrum, nightly warm oil injections, insertion of suppositories containing extract of belladonna, gr.  $\frac{1}{4}$  (0.016), every three or four hours, having the patient rest in bed, take an occasional dose of aspirin, and rub chloroform liniment into the skin covering the sacrococcygeal region.

*Alcohol injections* made into or about nerves have failed to benefit the author's patients, and such treatment has been discarded because of the destructive action of alcohol on nerves and pain caused by the injection.

**Operative Treatment.**—The author has cured 90 per cent. of 100 cases of coccydynia treated by coccygeal *excision* (Fig. 157, described on p. 166), and has almost or completely arrested pain in 10 of the cases through severing attached muscles from the coccygeal tip—subcutaneous tenotomy—the technic of which has been outlined previously.

DISEASES AND TUMORS OF THE COCCYGEAL BODY—LUSCHKA'S GLAND  
—GLOMERULI ARTERIOSI COCCYGEI

Luschka (1859) discovered a body, split-pea size, attached to the inner surface of the second coccygeal segment between the lateral attachments of the levator ani muscle, composed of club-shaped branches of the middle sacral artery and sympathetic nerve filaments.

These enlargements contain one or several large corpuscles, bound together by connective tissue, enclosing glandular elements, and receive their nerve supply from the coccygeal ganglion.

Arnold disproved the glandular theory of Luschka by distending the coccygeal body with an injection made through the sacral artery, and showing it was made up of arterial capillaries resembling a bunch of grapes, and renamed it "glomeruli arteriosi coccygei."

Banks verified the constancy of Luschka's gland or body and said it possessed a gelatinous consistency and contained numerous cavities distended with cells and granules, surrounded by nucleated fibers, and that the arterial twigs were lined with endothelium.

The body is not a vestigial remnant, nor does it functionate other than as an aid to the middle sacral artery like caudal and auxiliary hearts in some animals.

This obscure structure resembling the parotid gland has received but slight consideration in works on anatomy, and its pathologic significance is not understood.

Luschka believed inflammation of the body caused *coccydinia* and that perineal cysts and *cystosarcomatous tumors* of the coccyx originate here.

The author has several times known the coccygeal body to become inflamed or infected through exposure, trauma incident to passage of hardened feces, careless instrumentation, extension of rectal or sacrococcygeal disease, or pressure of a bowel tumor.

It is not improbable that fistulæ opening at the coccygeal tip, not otherwise explainable, are secondary to changes in this body. Twice the author has extirpated orange-sized cysts from the coccygeal periosteum at the site of Luschka's gland, and believes the coccygeal body was in some way connected with their formation owing to the evidence of previous trouble in Luschka's gland shown by the histories.

**Symptoms.**—Inflamed coccygeal bodies are larger than normal or sensitive to the touch, and cause discomfort or pain during defecation when feces are nodular. One of the author's patients

during attacks constantly complained of heavy aching pains in the coccygeal region.

**Diagnosis.**—These diminutive bodies when inflamed, diseased, or the site of tumors are easily detected through digital examination by grasping the coccyx between the finger and thumb (Fig. 156), and when felt one can determine whether they are diseased by pressing them against the bone, which elicits pain.

Inflamed coccygeal bodies are firm, round, mobile, sensitive, and vary from split-pea to cherry size.

**Treatment.**—Discomfort incident to an inflamed coccygeal body is mitigated by hot oil or water enemata, astringent irrigations and suppositories containing cocain, gr.  $\frac{1}{8}$  (0.008), and belladonna, gr.  $\frac{1}{4}$  (0.016), inserted as required; if infected, the swelling is incised and drained, but when the tumor keeps the patient uncomfortable for weeks or months it is extirpated through a posterior median incision or an external operation including excision of the coccyx.

#### ANALYSIS OF THE AUTHOR'S CASES OF SACROCCYGEAL DISTURBANCES

The accompanying table gives a fair idea of sacroccygeal deformities, injuries, diseases, and tumors, their causes, character, complications, and treatment.

Since the publication of these statistics in 1902 the author has operated upon many other cases resembling or differing from those included in the table.

#### AUTHOR'S THIRTY-SEVEN CASES OF SACROCCYGEAL DEFORMITIES, FRACTURES, DISEASE, INJURIES, AND TUMORS<sup>1</sup>

Disease, injury, or tumor.		Number of cases.	Number of females.	Number of males.	Average age, years.
Varieties of diseases treated.	Fracture or dislocation.....	8	4	4	31½
	Coccydinia.....	12	8	4	31½
	Inflammation of coccygeal body.....	2	2	0	24½
	Congenital deviation of coccyx.....	2	2	0	30½
	Necrosis of coccyx and fistula.....	4	2	2	34
	Absence of coccyx and sacrum.....	2	1	1	29
	Ulceration of coccyx through rectum...	1	1	0	24
	Dermoid cyst of coccyx.....	2	0	2	38½
	Gunshot wound of coccyx.....	1	0	1	40
	Nail driven in sacroccygeal joint.....	1	1	0	36
	Coccygeal lipoma.....	1	1	0	35
	Inclusion cyst of coccyx.....	1	0	1	49
Totals.....		37	22	15	33

<sup>1</sup> See Gant, Diseases of the Rectum and Anus, 1902, p. 168, for detailed description of these cases.

## SACROCOCCYGEAL (PILONIDAL-POSTANAL) DIMPLES, CYSTS, AND FISTULÆ

Postanal dimples—fovea sacrococcygeal (Fig. 161)—and deep fissure-like crevices are occasionally encountered in the median line over the sacrum and coccyx of infants, children, and adults. Such pits or depressions may be primary or secondary, vary from pin-head to pea size, are funnel shaped, lined with skin containing sebaceous glands and hair-follicles, and may attain a depth from  $\frac{1}{2}$  to 1 inch (12.7 mm.—2.54 cm.) or more (Fig. 164), and nearly always occur in men, as shown by the author's 80 cases—60 men and 20 women.



Fig. 161.—Pilonidal sinus—sacral dermoid—having four fistulous openings.

Postanal dimples may exist independently or be connected with spina bifida occulta, but are more often associated with sacrococcygeal dermoid cysts—epidermoid. Hairs in the dimple are rooted to the skin, while those contained in cysts lying over the sacrum are detached and are to be seen in collections curled up or straight (Fig. 165, A).

These depressions and fistulæ (Figs. 161–165) resulting therefrom are met with more often in men than in women; the ratio being about 3 to 1, and may be superficial or extend deeply to the spine or into the neural canal in the presence of spina bifida. Post-



anal dimples are congenital, the result of maldevelopment, where posterior halves of the fetus do not perfectly approximate.

Perspiration, dirt, saprophytic, and pyogenic organisms collect in these deep, funnel-shaped depressions, and plus trauma to the parts, caused by sitting on hard seats or a fall upon the buttocks, lead to a simple or more often suppurative inflammation that terminates in abscess, fistula, or in rare instances sealing up of the external opening and formation of a true cyst containing sebaceous matter, loose or rooted hairs (Fig. 165, *A*), and *débris*.

Infection of postanal dimples and sacral dermoids inducing sacrococcygeal fistula occurs in the majority of instances in patients whose ages vary from eighteen to thirty years.

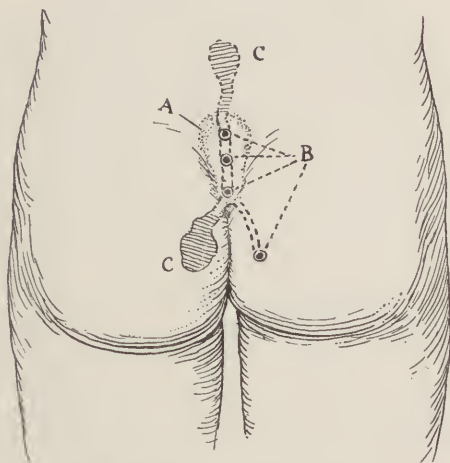


Fig. 162.—Multiple abscess and fistulous openings complicating sacral dermoid.

These *culdesacs* because of their appearance are often mistaken for tubercular fistulæ or sinuses leading to necrosed bone, because they do not readily respond to treatment.

In most of the author's cases postanal dimples have been associated with and acted as a guide to diminutive or large sacral dermoids that had not degenerated, or which *had* formed fistulæ, one to three in number, opening one above the other, in the sacrococcygeal crease. When operating he feels more certain of a cure when hairs are detected and a containing sac is removed than when none is discovered.

Sacrococcygeal fistulæ seldom diverge to the right or left, and dimples and fistulous openings are usually located in the posterior median line near termination of the crease separating the buttocks, 1 inch (2.54 cm.) or more behind the anus.

Non-infected *culdesacs* have been encountered connected with or without diverging suppurating tracts or diverticulæ.

Postanal dimples and fistulæ occasionally pass to and partly around (Fig. 162), but rarely enter the rectum; and sinuses connected with the *culdesac* or dermoid are seldom deep, but are encountered in the subcutaneous fat and external to the fascia and ligaments covering the sacrococcygeal region.

**Symptoms and Diagnosis.**—Postanal dimples may exist for years without producing manifestations, and are seldom detected in children except accidentally. When the *culdesac* becomes infected,

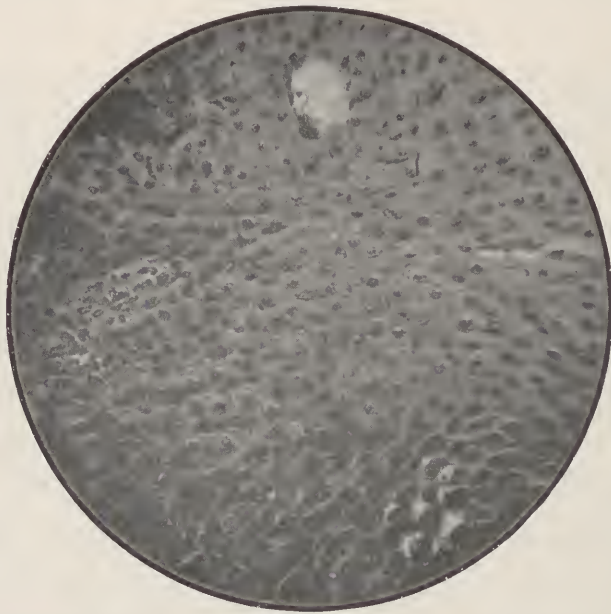


Fig. 163.—Microscopic appearance of embryonic tissue removed from a pilonidal sinus (Morris).

adjacent or overlying skin and fat gradually become sensitive, swollen, indurated, and reddened; this sooner or later is followed by a serous or seropurulent discharge, lacking in odor.

When there is a dimple plus a discharge the patient probably has a dermoid cyst, or else necrosis of the sacrum or coccyx, the result of luetic or tubercular involvement.

**Treatment.**—Symptoms incident to an irritated or inflamed postanal dimple are quickly mitigated or relieved by wiping or syringing the *culdesac* clean of perspiration, sebaceous matter, dirt, soap, loose hairs, and covering it with zinc oxid plaster.

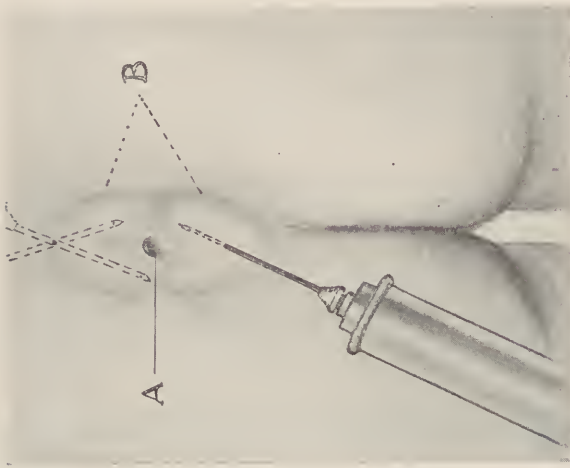


Fig. 164.—Author's method of anesthetizing structures when operating for sacral dermoid:  
*A*, Postanal dimple; *B*, anesthetized area.

Once the *culdesac* or connecting dermoid cyst has degenerated or become infected, palliative measures are useless from a curative viewpoint.

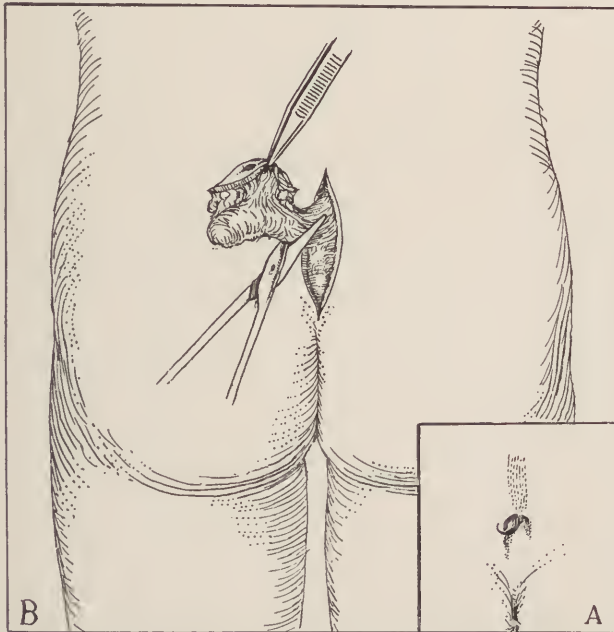


Fig. 165.—Excising a pilonidal sinus under local anesthesia: *A* shows appearance of loose hairs projecting through a postanal dimple prior to operation; *B*, dermoid cyst dissected free, ready for excision and closure of the wound with catgut.

Shallow dimples are removed with scissors and the wound allowed to granulate, but when deep or burrowing they are *excised* under local anesthesia by elliptic incision, following which the wound is approximated with catgut, reinforced, if indicated, by retention linen sutures.

Some authorities recommend *curettage* and irrigation, a treatment to be discountenanced, because it rarely effects a cure and often leads to infection.

Sacrococcygeal dermoid cysts are permanently eliminated by excision (Figs. 164, 165) or by incision of the cyst, removal of contained hairs, *débris*, cyst contents, and wall with the curet, and by irrigation and division of connecting fistulous sinuses after the parts have been infiltrated with eucain.

Occasionally time is saved by immediate closure of the wound with catgut, but a cure is more certain when it is permitted to slowly heal by granulation. Should a sinus open into the rectum, division of the sphincter is essential to a cure.



## Chapter X

### Backache and Sciatica

#### SACRO-ILIAC RELAXATION, DISPLACEMENT, AND INFLAMMATION

##### BACKACHE

PAINS in the lower back are frequent and may cause slight discomfort or marked distress continuously or at short or longer intervals.

Owing to the frequency with which backache is caused by or confused with anorectal and sacrococcygeal diseases, it deserves a place in a work of this character.

Like some other troublesome ailments in these regions it should be regarded and treated as a symptom and not a disease, hence an attempt to invent a definition for it would be useless.

Backache is common during active periods of life and is encountered more frequently in women than in men, usually due to pregnancy, injury incident to childbirth, retrodisplacements, diseases, and tumors of the uterus and adnexa.

**Etiology.**—Formerly pains in the sacrolumbar region were diagnosed as *lumbago*—myositis—or *strain*, but so-called rheumatism involving muscles of the region is seldom responsible for the distress, in evidence of which Lovett's 83 backache cases included but one due to true *lumbago*.

Prominent among the etiologic factors of backache are: violent exercise, overindulgence in sexual relations, falls, injuries, exposure, lifting of heavy objects, strains that stretch or break ligaments and muscles, focal infections, anorectal affections—fissures, ulcers, hemorrhoids, inflamed crypts, blind fistulæ, hypertrophied papillæ, strictures or tumors that press upon the nerves or coccyx and excite frequent and prolonged contractions of the sphincter, levator ani, and other muscles attached to the spinal tip, or that induce pains that radiate to the sacrococcygeal region, deformities, diseases, and growths that lead to reflex discomfort in the back.

Affections of the sacro-iliac or spinal joints, relaxation (Fig. 166), dislocation (Fig. 167), arthritis, infection, injury, and necrosis are undoubtedly the most frequent causes of backache; fractures, exudates, and exostoses that involve joints or nerves of this region are less often responsible for the trouble.

The most distressing cases are often due to *loose joints* (Fig. 166), which must be considered in the treatment if a permanent cure is to result. Many postoperative backaches formerly attributed to the patient's taking cold result from trauma caused by pelvic strain under anesthesia when the back is bent and legs are left hanging over the table from muscular relaxation and sagging of the spine, or from careless handling of the patient by rough orderlies in transportation to and from the operating table.



Fig. 166.—Left sacro-iliac relaxation with atrophy and  $\frac{3}{8}$ -inch slipping. Radiographed at the Hospital for Joint Diseases.

Not infrequently distressing pains in the sacrolumbar region are traceable to weak springs or a soft bed that compels the sleeper to assume a twisted or curved posture, to falls upon the sacrum or coccyx, or fracture or dislocation of the lower end of the spine during labor.

Occasionally backache is due to disease or injury of the spinal cord, tuberculosis, or lues of the column, sacrum, or coccyx, arthritis deformans, diseased or displaced kidney, enteroptosis, invagination of the sigmoid flexure into the rectum, impacted feces, the menopause, abdominal adhesions, or complication of neurogenic dis-

turbances; search should always be made for foci of infection in the teeth, tonsils, etc.

**Symptoms.**—The manifestations associated with backache vary in accordance with the disease responsible for it. When due



Fig. 167.—Sacro-iliac luxation, showing absence of lordosis and lateral deviation of the spine.

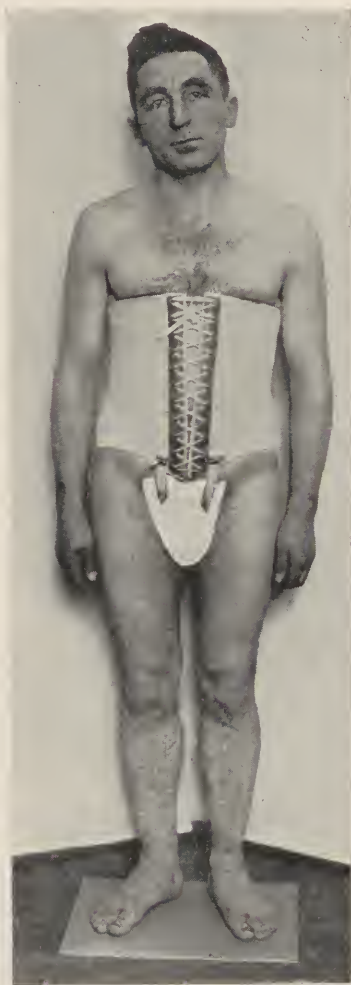


Fig. 168.—Same case. Second jacket after two months showing normal position of joint and correction of spinal curvature. (Hospital for Joint Diseases.)

to sacro-iliac joint disturbances (Fig. 167) patients suffer from neuralgic pains in the sacro-iliac region and sometimes the hip, leg and heel, or epigastric region. In such cases bending the body

causes discomfort and adjacent muscles may spasmodically contract and cause sharp pain; rest in bed is often very disappointing, as the recumbent may cause greater discomfort than the erect posture.

**Diagnosis.**—The cause of backache is difficult to determine, and the patient must be carefully examined to ascertain if there be an abdominal, pelvic, vesical, rectal, or urethral tumor or disease that directly or reflexly causes the discomfort; cystoscopy, ureteral catheterization, pyelography, and urinary analysis are necessary to determine whether or not the urinary tract be involved; focal infections must be excluded.

Considerable time should be allotted to inspection and palpation of the spine and sacro-iliac joints, that an arthritis, tubercular osteomyelitis, exostosis, fracture, dislocation, enlargement, deformity—kyphosis—or sensitive area may be located; the patient should be put through bending exercises and the legs flexed, for these maneuvers may demonstrate location of the lesion responsible for backache; an early lumbar spinal tuberculosis should not be overlooked.

Finally, radiographs (Fig. 166) may be necessary to verify or complete the diagnosis.

**Treatment.**—Therapeutic measures employed in the treatment of backache depend upon the disease and whether the patient seeks *temporary relief* or desires a cure; should he choose the former, ordinarily he can be made comfortable in short order by keeping him in bed fitted with an even, firm mattress and employing friction, massage, faradic, high-frequency, or the sinusoidal electric current, hot fomentations or salt-bags to the painful area to soothe irritable or inflamed nerves, and relax spasmodically contracted muscles.

The rubbing in of liniments is occasionally helpful, but when pain is agonizing and the sufferer is exhausted from distress and loss of sleep relief is quickly obtained by reinforcing the above measures with aspirin, gr. x to xx (0.6–1.3); phenacetin, gr. v to x (0.3–0.6); sodium salicylate, gr. xv (1.0); sodium bromid, gr. xxx (2.0), or morphin, gr.  $\frac{1}{4}$  (0.016), as required when other drugs do not mitigate or arrest suffering.

Constipation complicated by fecal impaction or auto-intoxication sometimes aggravates or causes backache, and daily full soft evacuations should be procured with a saline mineral water, Epsom salts, tonic dinner pills, senna, or mineral oil.

Rheumatic subjects do better under alkalies, potassium citrate, sodium bicarbonate, and a restricted diet where sweets and red



meats are totally excluded; this done only after excluding focal infection.

When backache is due to *sacro-iliac joint relaxation* the above treatment is reinforced by partial immobilization of the trunk by a snugly fitted jacket (Fig. 168), or strong, broad overlapping zinc oxid adhesive straps passed around the body and made to cross each other over the sacrum and ileum or higher up when indicated; generally a pad is placed over the joint and the bony prominences over which the straps pass are protected from pressure.

Diagonal strapping is preferable, and better results are obtained when it is reinforced by a few circular straps. The adhesive, changed from time to time, is worn for several weeks or until pain subsides and inflammation within the spinal or sacro-iliac joints ceases, when it is abandoned for a well-adjusted corset or supporting belt.

Tubercular spines are treated in the usual way; suspension and the application of plaster-of-Paris jackets, fresh air, tonics, feeding, etc., followed later, if advisable, by lighter braces or celluloid jackets.

Operations varying in character, described in this or other works on surgery, are sometimes indicated in the treatment of backache induced by enteroptosis, disease, or tumors responsible for the trouble, and where the sacrum, coccyx, or ileum is enlarged, necrosed, dislocated or fractured, and to correct anorectal affections exciting spasmodic contractions of muscles attached to the coccygeal tip.

#### SCIATICA

*Definition.*—Sciatica is characterized by pain in the hip and leg limited to the regions innervated by the sciatic and its branches.

This distressing neurogenic ailment, common to middle or active life and old age, is encountered in men more often than women.

Some physicians hold sciatica is a clinical *entity*, but recent investigations indicate it is a symptom in nearly if not all cases, and that pain may be a manifestation of a *neuritis*, *perineuritis*, *compression*, or *disease* of the sciatic nerve or its controlling center.

The author doubts if neuralgia simulating sciatica is due to neuritis or perineuritis, believing it is more often caused by *nerve irritation*, anemia, or a toxin. Undoubtedly sciatica is frequently induced by a *mechanical* disturbance located along the nerve or its origin.

*Etiology.*—Sciatica is said to have resulted from the following causes working independently or together: exposure, anemia,

wasting disease, constipation with auto-intoxication, fecal impaction, and toxemia, external violence, enlargement, displacement, tumor, disease, inflammation, or dislocation affecting the bones, joints, or structures with which the sciatic nerve or its branches comes in contact or that involve centers presiding over them, anal fissure, blind fistula, hemorrhoids, cryptitis, enlarged papillæ, hypertrophy of the levator ani, sphincter or rectococcygeal muscles, chronic infection, enteroptosis, invagination of the sigmoid flexure, abdominal, pelvic, uterine, vesical, or prostatic disease, exudates or tumors that disturb the nerve through compression, extension, or reflexly.

Formerly sciatica was considered a *medical*, but is now regarded as a *surgical*, ailment because it has been demonstrated that in most instances by correcting bone lesions, strengthening and otherwise relieving relaxation and inflammation of the sacral and lumbar joints, and freeing the nerve from pressure otherwise induced, sciatica may be relieved or cured.

Pain simulating the condition reflexly induced by fissure in ano, sphincteralgia, etc., and disease in neighboring or distant organs should not be diagnosed as sciatica, but regarded and treated as a manifestation of the affection or condition responsible for them.

**Symptoms.**—The chief manifestation of so-called sciatica is a heavy, distressing, neuralgic-like pain in the hip and outer side of the thigh in and about the sciatic nerve; as a rule suffering is not great below the knee, but it is at times felt in the calf and heel.

Tender points are located in the gluteal region and popliteal space, though soreness may be elicited throughout the course of the nerve. Reddening or edema of the skin, paresthesia, twitching sensation, temperature, and lessened mobility or atrophy of leg muscles are rarer complications of sciatica.

**Diagnosis.**—The diagnosis of sciatica is easy in most instances and based upon information obtained from the patient regarding the character and location of his pain, and by palpating at different points over the nerve, but often it is difficult to determine what is *causing* the sciatica.

Since the condition more often arises from bone disease, dislocation, or relaxation with or without inflammation of the joints in the lumbar, coccygeal, and sacro-iliac regions, these structures must be carefully inspected, digitally examined, and x-rayed (Fig. 166) that the cause or factors disturbing the sciatic nerve may be determined.

Sometimes having the patient bend the body laterally or anteroposteriorly helps to clear up the situation by eliciting sensitive areas. Muscular spasms of the back and deformity point to spinal trouble and difficult flexion and abduction of the leg to hip-joint disease.

Tumors and disease in the abdomen, pelvis, and neighboring organs must be sought for, since through direct pressure or reflexly they frequently cause pain along the sciatic nerve in the calf and heel; cancer, fissure in ano, and hemorrhoids are common offenders, and disease in and displacement of the kidney and ptosis of the abdominal organs are not to be overlooked, for they may be accompanied by similar manifestations.

Finally, syphilis and tuberculosis, not infrequent diseases of the sacro-iliac region, must be borne in mind.

**Treatment.**—Pain can be relieved and frequency of attacks diminished by a combination of the following therapeutic measures: heat in the form of an electric pad, baking, cautery, hot fomentations, hot salt-bags, or an oven is the most serviceable agent when applied to all regions of the painful nerve.

In acute cases rest in bed, immobilization of the leg in plaster-of-Paris spica or long splints, rubbing the affected area with an epinephrin or methyl salicylate ointment, and administration of antipyrin-empirin, or in distressing cases morphin, greatly mitigates suffering, but when sciatica is chronic, sodium bromid or iodids and colchicum are substituted for opiates (to prevent the patient becoming a habitu   to the drug) and minimize nervousness and permit the patient to obtain sleep and rest.

Many measures have been tried with more or less success in the treatment of obstinate cases of sciatica; the most reliable of which are: *gymnastics*, *hyperextension*, *dry cupping*, *cauterization*, linear or interval acupuncture, *fly blistering* and *high-frequency electricity* applied at the point of its emergence and along the course of the nerve as often as required, reinforced by mercury and iodids if indicated.

Exposure and stretching the nerve have occasionally been performed, but with disappointing results to the author, and injection of the sciatic nerve or adjacent structures with sterile water, alcohol, normal saline, and other solutions has seldom prevented or totally relieved pain. Alcohol injections are contraindicated, for the drug causes degeneration of nerve tissue, and the infiltration induces sharp pains radiating to the popliteal space, calf of the leg or heel, or numbness of the limb, consequently, the injections must not be repeated oftener than once a week.

The author has obtained best results where a  $\frac{1}{8}$  of 1 per cent. eucain solution was deposited in proximity to, but not in, the nerve.

Large doses of salicylate of soda or citrate of potassium administered in water of wintergreen is helpful in rheumatic subjects. Iron, arsenic, and outdoor exercise are beneficial when the sufferer is anemic or run down.

If sciatic pain is caused by looseness or inflammation of the spinal or sacro-iliac joints, nothing brings quicker relief or hastens the cure more than well-adjusted adhesive straps or jacket (Fig. 168) that support the trunk and act as a splint, when applied after the manner given in the treatment of backache due to sacro-iliac joint involvement.

**Surgical intervention** is imperative when a cure is to be obtained where sciatic pains are due to necrosis or outgrowth of bone, inflammatory exudates, tumors or disease in neighboring or distant parts, or when the condition arises from external violence.



## Chapter XI

### Anorectal Wounds and Injuries<sup>1</sup>

MINOR injuries are frequently observed about the anus and rectum, but extensive, dangerous, contused, lacerated, and perforated intestinal wounds most frequently involve the abdomen, small intestine, and colon.

The rectum and anus are less often subjected to trauma because of their location within the buttocks and protection of the surrounding bony structures—symphysis pubis, sacrum, coccyx, iliac bones, and their tuberosities.

#### ETIOLOGY AND CLASSIFICATION

The rectum may be injured from *above* through contusions, bullet or knife wounds, or from *below*, particularly when the body is bent forward when the injury is received.

**Types of Wounds and Injuries.**—Wounds of the anorectal region may be classified as *contused*, *lacerated*—*ruptured*—*incised*, *perforating*, *pneumatic*, and *miscellaneous*.

**Contused** wounds are encountered less often about the rectum than colon, and are usually induced by being run over, kicks, blows, falling from a height upon the buttocks, reckless divulsion of the sphincter, evacuation of hardened feces, careless instrumentation, and introduction or pressure of pessaries.

**Lacerated Wounds.**—Laceration and rupture of the rectum and anal canal, occasionally encountered, may be slight or extensive. Most often laceration results from the discharge of impacted fecal matter, careless introduction of the finger, hand, speculum, proctoscope, bougie, other instrument, or defective enema tube.

The author has treated many diminutive, moderate, and extensive lacerations of the mucosa and other rectal coats caused by enema tubes that were rough, sharp pointed, or which had been forced into bowel tunics, or broken, following which grave hemorrhage, abscess, or peritonitis were complications. He has handled other patients where injury was induced by a kick or blow on the anus, pederasty—rectal masturbation—divulsion of the sphincter, or strictures with dilators or bougies, tearing of the gut

<sup>1</sup> For a discussion of wounds and injuries involving the abdomen, colon, and sigmoid flexure see Vol. II, Chapter XLII.

during operations on the bladder, prostate, pelvic or abdominal organs, evacuation through the rectum of a large vesicle calculus (Fig. 686), foreign bodies—fish and chicken bones, enteroliths, safety-pins, nail, fish-hook, pieces of glass, and triangular piece of metal.

Other cases have been encountered where the patient had been run over, run into by a wagon tongue, fallen from a height,



Fig. 169.—Enormous injury to the anus, rectum, perianal region, buttocks, perineum, and scrotum caused by rupture of the urethra and urinary extravasation. The accident occurred to a young boy while attempting a circus stunt by riding a bicycle on a tight wire. The wire broke and the boy retained his seat when the bicycle struck the ground, sustaining the above injury. (Author's case.)

sat down on or had been thrown against a blunt or ragged object—stone, stump, paling, scissors, door-knob, pitchfork, or dashboard of a wagon—crushed by machinery, or hit by flying shrapnel and other missiles.

The rectum has been ruptured several times where bougies were forced through strictures above or below the peritoneal attachment, and similar injuries have been caused by careless or

forcible introduction of the sigmoidoscope and passage of instruments or bougies by experienced surgeons, where the bowel was strictured, extensively ulcerated, or involved by cancer.

Ruptures have also followed distention of the bowel with air and gas for diagnostic purposes, stretching and massaging the gut



Fig. 170.—Extensive sloughing of perianal region, thighs, scrotum, and penis complicated by multiple fistulae and deep phlegmonous ulcers from the extravasation of urine caused by an injury to the urethra and perineum incident to a fall upon a ragged piece of wood. (Author's case.)

with inflatable rubber bags for constipation, and introduction of compressed air in a spirit of fun (Figs. 674, 675). Similar injuries have followed introduction of the hand during examination and employment of large operating specula, and where the subject had been squeezed by machinery, caught between colliding cars, or injured by shrapnel.

**Incised Wounds.**—Accidental clean-cut wounds of the rectum and anus are usually made by knife or bayonet, but may be the result of sitting or falling upon a pointed or edged instrument or object, evacuating bones, pieces of glass, nails, tacks, burglar files, or other foreign bodies having an angulated or sharp edge. The rectum is also frequently injured during operation upon the bowel and adjacent organs.

Rectal tears are occasionally induced by the head during labor, escape of skull bones through the bowel (Fig. 680), bursting of abdominal, pelvic, ischiorectal abscesses, encroachment of a displaced or deformed coccyx, introduction of sounds and catheters, and crushing operations for vesicle calculi.

**Perforating—Penetrating, Puncture—Wounds.**—Perforation of the small intestine and colon are more frequently caused by typhoid, ulcers, and infectious types of colitis than accidental injuries.

Perforations of the rectum may be induced by a bullet, knife, or bayonet thrust, pointed or sharp-edged foreign body—pin, needle, knife, piece of glass, etc.—swallowed or introduced through the anus.

Occasionally prisoners and insane persons swallow or conceal foreign bodies in the rectum, and the author has treated two men who swallowed nails, pieces of glass, needles, pins, and open knives for a living, who eventually died from perforation and peritonitis. Frequently the surgeon's knife, needle, or scissors accidentally puncture the bowel during rectal, pelvic, vesical, prostatic, or urethral operations, and occasionally scissors, knives, forceps, needles, gauze, ligatures, and other foreign objects or substances left in the abdomen perforate and are evacuated through the rectum.

One of the most frequent and unnecessary causes of perforation is the careless introduction of imperfect hard-rubber, metal, or glass enema tubes that break or penetrate the gut wall when force is used.

The author has treated 4 patients for complete laceration of bowel made by careless surgeons who used unsuitable instruments while packing wounds, and handled another case where injury was caused by distending the rectum with gauze during an attempt to control hemorrhage.

Perirectal and ischial abscesses nearly always perforate the rectum, but pus from pelvic, spinal, and coccygeal abscesses rarely discharges into the bowel.

**Pneumatic Wounds.**—Distention of the rectum and colon with air or gas is a diagnostic aid in certain cases, but when carelessly



practised rupture may ensue from overdistention. Several times perforation has followed employment of the pneumatic sigmoidoscope, due in some to high air pressure, and in other instances to forcing the instrument through the angulated bowel.

Lacerations and rupture of the rectum have also followed dilatation, massage, and stretching the rectum with air-filled rubber bags in the treatment of chronic constipation and stricture.

Pneumatic rupture of the rectum most frequently occurs as a result of *joking*, and recently several such cases have been reported (see wounds and injuries of the *abdomen*, *colon*, and *sigmoid flexure*, Figs. 675, 676, Vol. II, Chapter LXII).

Many factories employ compressed air to blow away filings, shavings, and dust, for cleaning flues, motor power, and riveting bolts, and employees often use it to clean their clothing; the air being permitted to escape through a narrow nozzle at a pressure of 40 to 125 pounds. When a new employee enters the factory he is sometimes initiated—hazed—by having the air turned upon him, which causes a sharp stinging sensation when applied to the skin.

In 95 per cent. of rectal and colonic ruptures from this source the victim is bent over, and the tube placed at or near the anus (Fig. 674) and the air turned on in a spirit of fun; in nearly every instance air penetrating the clothing entered the anus and ruptured the small intestine, colon, sigmoid flexure, or rectum, which was immediately followed by an outcry and fainting or collapse of the victim. Rupture usually occurs in the sigmoid flexure, but in some instances the bowel tears at several points or throughout its entire length, and the blowout is complete; but sometimes the peritoneal and muscular tunics give way and the mucosa extrudes through them, forming a traumatic false diverticulum.

**Other Wounds and Injuries.**—Injury to the rectum and sub-mucous and subcutaneous tissues is frequently caused by the injection of carbolic acid in the treatment of hemorrhoids. The author has handled cases where ignorant employment of this agent led to violent inflammation of the anorectal region, abscess, fistula, terrific sloughing (Fig. 328), embolism, and pneumonia. Several times he has treated extensive burns resulting from improper use of acids, turpentine, zinc paste, silver nitrate, and electric and Paquelin cauteries, and has frequently been consulted by patients suffering from painful injury induced by the snapping of the blades of a sharp-edged speculum or end of the proctoscope, caused by the patient's straining against it following removal of the obturator. Finally, cases were encountered where the buttocks and anal canal

had been slightly or extensively lacerated by the patient's fingernails while scratching to relieve pruritus ani.

Recently the author was called in to extract several pieces of glass from the rectum and sigmoid the result of an exploded high-frequency tube.

#### SYMPTOMS

Manifestations of anorectal injuries vary with extent, character, and location of the wound, time elapsed between when it was made and operation, and whether or not the wound drains freely.

Traumatic lesions of the upper rectum and sigmoid flexure are more serious than lower rectal injuries because often complicated by infection, abscess, and peritonitis.

Contused and lacerated injuries cause dangerous manifestations less frequently than deep punctured wounds because they are larger, frequently superficial, and drain freely.

**Blowouts** or **pneumatic** ruptures of the rectum or colon are the most serious of intestinal accidents since the gut is torn through, and blood, gas, feces, and pathogenic organisms escape into the abdominal cavity to cause peritonitis, abscess, or fecal fistula.

**Superficial** injuries and foreign bodies in the anal canal, through irritation, induce pain, tenderness, soreness, tenesmus, and spasmodic contraction of the sphincter and levator ani muscles, and occasionally incontinence of urine or frequent micturition. Deeper wounds similarly located cause like symptoms, but when they do not drain freely infection ensues, and the patient suffers from a chill, high temperature, fast pulse, throbbing pain, furred tongue, and usual manifestations of abscess.

Extensive ruptures and tears below the peritoneal attachment cause little suffering after initial pain subsides because they drain freely, the sphincter muscle often being severed. Occasionally infection takes place or sloughing ensues from injury to vessels and tissues.

**Shock.**—Minor and major injuries of the rectum below the peritoneal attachment cause little or no shock except when considerable blood has been lost, but contused, lacerated, and pneumatic injuries affecting the abdomen, upper rectum, or colon are usually accompanied by profound shock, and the patient remains in a state of collapse until the injury has been repaired.

**Hemorrhage.**—Bleeding usually complicates intestinal wounds and is slight, moderate, or profuse, depending on the number and size of the vessels injured.

Clotted blood in the abdomen evidences extravasation and

favors peritonitis when it is not removed. Occasionally alarming secondary hemorrhage from sloughing occurs where vessels have been severely traumatized.

**Sepsis.**—Primary union is obtained in clean-cut wounds, but infection terminating in peritonitis, abscess, and fistula is a frequent complication of injuries involving the peritoneum, and penetrating, ragged, and uneven wounds that are not properly drained.

**Abdominal distention** and **tympanites** quickly follow perforation, laceration, or rupture of the small or large intestine or rectum above the peritoneal attachment.

**Urinary incontinence** or **difficult micturition** are observed where the bowel, external sphincter, and levator ani muscles or urethra have been severed.

**Abdominal pain** and **tenderness** complicate complete tears in the large bowel, and intense colic is characteristic of pneumatic rupture of the gut. The **pulse** and **temperature** remain normal where the lower rectum has been injured and properly drained, but are abnormal when the wound is infected or involves the colon or sigmoid.

#### COMPLICATIONS

The following are the chief complications of anorectal wounds: abscess, rectovaginal, rectovesical, recto-urethral, ordinary or fecal fistula, fecal incontinence, stricture, hernia, urinary or fecal extravasation, sloughing of the mesentery, peritonitis, phlebitis, pneumonia, and necrosis of the sacrum, coccyx, or pelvic bones when contused.

#### DIAGNOSIS

Anorectal injuries are comparatively easy to diagnose when a history has been taken, the manner in which the accident occurred is learned, external evidences of trauma are observed, symptoms are studied, and the degree of bruising, ecchymosis, swelling, edema, and laceration of the perianal skin or abdomen is noted. Following inspection of the lesion digital and proctoscopic examination are practised when the rectum is involved, that the tear or perforation may be seen or felt and its extent determined. Promiscuous probing is dangerous and unsatisfactory in these cases.

When the upper rectum, sigmoid flexure, or colon is supposedly injured the abdomen is opened and the intestine examined until the accidental wound is located.

Perforations and tears in the rectum and lower sigmoid may

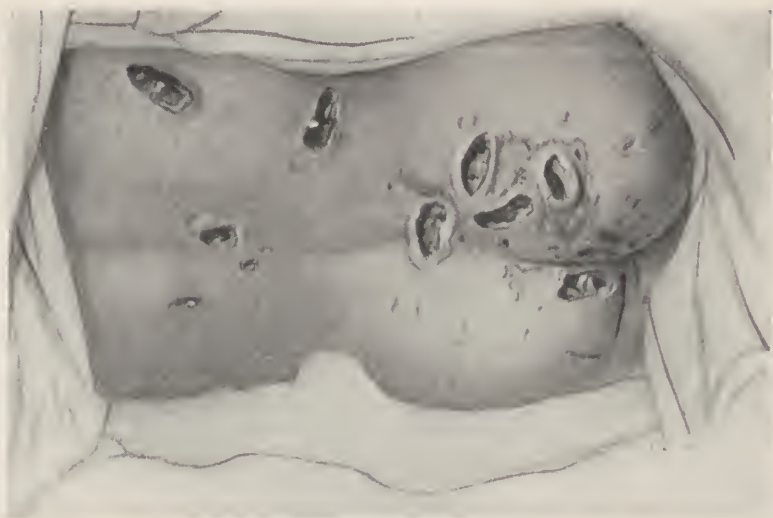


Fig. 171.—Multiple wounds of the back, buttocks, and perianal region caused by bomb explosion (British Medical Journal).

also be diagnosed through a sigmoidoscope and by inflating the gut with air, which escapes into the abdomen when it is lacerated.

#### TREATMENT

The treatment of anorectal injuries may be simple or complicated, but under all circumstances the wound is immediately cleansed and bleeding arrested that the character of the injury may be determined.

**Incised or clean-cut** injuries are closed with deep and superficial catgut stitches, the suture line is protected by collodion or gauze, and a drain inserted in the lower end of the wound to prevent infection.

**Contused, lacerated, and pneumatic** wounds in the lower rectum are drained at one or more points after hemorrhage has been arrested, ragged edges have been removed, and the wound irrigated. Dressings are not applied until the wound has been leveled, so that cup-like depressions are not left to catch infective agents. In extensive injuries sections of the wound are sutured with catgut before the drain is inserted to shorten convalescence.

During postoperative treatment suffering is less and the wound heals quicker when the patient eats regular meals and evacuations are kept normal or semisolid, for fluid stools induce pain and favor infection, while nodular feces traumatize the wound and cause unnecessary pain when evacuated.



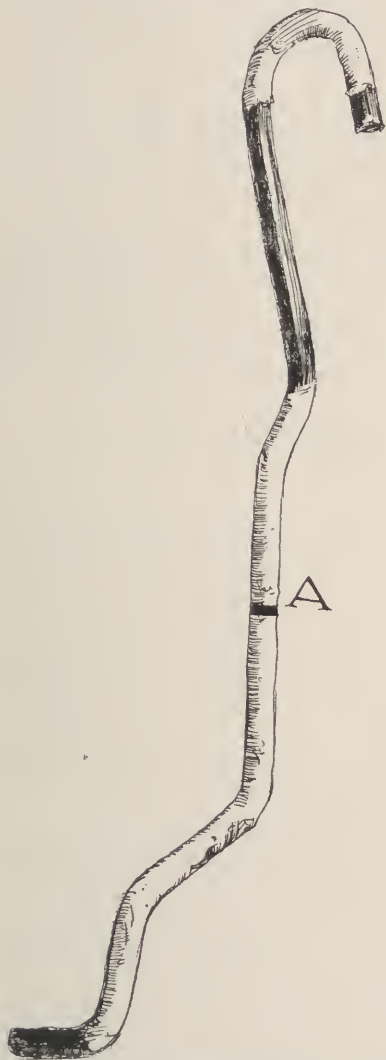


Fig. 172.—Iron hook (reduced one-third in size and length) that was forced through the anus, bowel, and peritoneum by the patient falling from a bed on to an iron cot. *A* marks distance to which the hook was driven into the bowel causing extensive laceration of sphincters, rectum, and peritoneum. The injury was repaired by a difficult plastic operation and the patient made a perfect recovery and gained complete control over the torn sphincter. (Author's case.)



Fig. 173.—Stick of wood (half size) that caused death from perforation and peritonitis the result of its being forced into the rectum by the patient's slipping and falling upon it while scratching himself to relieve pruritus ani.

Where the bladder or urethra is perforated or ruptured the tear in suitable cases is immediately repaired, and the rectal injury treated according to the plan outlined above, but when this is not feasible, the bladder is drained and the urethral or vesical wound is left to heal by granulation.

Rectovesical wounds are difficult to close, but when this has been successfully accomplished with through-and-through reinforced by Lembert sutures results are good except in delayed or infected cases.

Diminutive and large rents in the colon and sigmoid are repaired by a *purse-string* or *double line of infolding sutures*; but where mesenteric vessels are injured or the rectum, sigmoid, or colon are extensively damaged the bowel is *resected*, *excluded*, or an *artificial anus* is established by suturing the gut in the abdominal incision.

In rectovaginal perforations and tears better results are obtained when closure of the vaginal opening precedes approximation of the rectal edges of the rent.

Wire and other sutures employed in closing deep wounds are severed when signs of infection appear, and accompanying necrotic tissue is excised or dusted with calomel.

When blood, feces, or urine is found in the abdomen it is wiped out, the cavity irrigated with saline solution before the bowel or vesical rent is repaired, following which an abdominal drain is inserted to lessen danger from infection and peritonitis. Following repair of recto-abdominal injuries patients do better when kept in Fowler's position and on fluids for a few days.

Continuous cold antiseptic applications are agreeable, will minimize danger from infection, and also facilitate the healing of contused skin and abdominal wounds associated with anorectal and colonic injuries.

**Miscellaneous Injuries.**—When the rectum and perianal skin are *burned* with acid, zinc, silver nitrate, or turpentine *antidotal* agents are immediately applied to the injured area, and boric acid solution or a bland ointment, containing morphin or cocain, is prescribed to relieve pain and diminish sphincter algia. Later, when the patient is comfortable, the use of mild stimulating agents, ichthyol or silver nitrate, 6 per cent., will facilitate healing of the wound.

**Author's Cases.**—That an idea may be formed as to the frequency, causes, character, and complications of anorectal injuries the author has epitomized 64 cases coming under his personal observation:

1. Perforation of the rectum at the sphincteric juncture by fish bone.
2. Perforation and ischiorectal abscess from encysted fish bone.
3. Laceration of the anal canal induced by the evacuation of a large pig's knuckle.
4. Rectal puncture caused by a bullet.
5. Sloughing of rectum and buttocks secondary to urethral rupture and extravasation (Fig. 170).
6. Sloughing of rectum, buttocks, and scrotum from urethral puncture and complete urinary extravasation.
7. Laceration of sphincter, levator ani muscle, rectum, peritoneum, and fracture of the coccyx caused by boy falling on a piling.
8. Rupture of the rectovaginal septum during copulation.
9. Rupture of the sphincter during pederasty.
10. Fissure in ano caused by introduction of a speculum.
11. Rupture of the sphincter by Young's anal dilator.
12. Laceration of anal canal during rectal massage for prostatic enlargement.
13. Rupture of the perineum during parturition.
14. Complete laceration of the rectovaginal septum by baby's head during labor.
15. Rupture of the sphincter, rectum, and structures back to the coccyx resulting from the evacuation of a large impacted fecal mass.
16. Laceration of both sphincters induced by the expulsion of large bismuth concretion.
17. Long incised wound from the evacuation of a piece of glass.
18. Paralysis of the sphincter the result of strangulated procidentia recti.
19. Laceration of the anal canal incident to pederasty.
20. Rectovaginal rent induced by rectal distention with an air-filled rubber bag.
21. Perforation of upper rectum made during an operation on the bladder.
22. Death from rupture of the rectum and peritoneum caused by falling on sharp-pointed stick.
23. Penetration of buttocks and perirectal space with formation of an abscess induced by sitting on a nail.
24. Contusion of the buttocks, fracture of the coccyx, and rupture of the sphincter resulting from a kick during a fight.
25. Hypertrophy of the sphincter and levator ani muscles from grape seeds lodged beneath the anal mucosa.
26. Intense pain from fish-hook caught in anal canal (Fig. 677)

27. Puncture of the rectum caused by swallowing an open safety-pin.

28. Laceration of the sphincter, levator ani, and rectovesical partition caused by a man being thrown upon the splintered dashboard of a wagon during a runaway.

29. Laceration of rectum and adjacent structures by a broken glass irrigating tube.

30. Puncture of the rectum by the sharp glass nozzle of an enema syringe.

31. Extensive sloughing of the rectal mucosa following the application of nitric acid to an ulcer.

32. Extensive rectal excoriation from a silver nitrate stick that escaped into the rectum.

33. Puncture of the rectal wall by cautery point during cauterizations made for rectal procidentia.

34. Rupture of the lower end of the sigmoid flexure induced by the introduction of a pneumatic sigmoidoscope.

35. Rupture of an ulcerated strictured rectum with a Wales bougie.

36. Complete laceration at the rectosigmoidal juncture by gas and fecal distention complicating obstructing rectal carcinoma.

37. Rupture of a tubercular sigmoid from fecal impaction.

38. Tearing in two of syphilitic sigmoid flexure while lifting the bowel up for colostomy.

39. Extensive sloughing of lower rectum, rectovesical, and buttocks caused by the injection of carbolic acid into hemorrhoids (Fig. 328).

40. Deep puncture of the buttocks on either side of the anus made by sitting on a pair of scissors.

41. Laceration of the anus and buttocks by dog bite.

42. Recto-urethral fistula from the passage of a sound.

43. Complete laceration of the sphincter and rectum with rupture of the peritoneum from falling upon an iron hook.

44. Irritation and submucous abscess from an apple peel lodged beneath an ulcerated mucosa.

45. Perforation of the rectum by forceps left in the abdomen.

46. Extensive laceration of the anal canal and sphincter caused by forcible dilatation with Pratt's rectal speculum.

47. Rupture of an ulcerated rectum induced by packing during an attempt to control hemorrhage.

48. Circular cut in mucosa made by introducing a proctoscope upward following withdrawal of the obturator.



49. Contusion of the anal canal from snapping together of the blades of a speculum.
50. Extensive sloughing of the mucosa from turpentine enema.
51. Rupture of the rectovesical septum by a urinary calculus.
52. Unintentional rectal wound made during operation for perirectal abscess.
53. Laceration of buttocks and rectum of boy gored by a cow.
54. Necrosis and ulceration of the rectovaginal septum caused by ring pessary.
55. Rupture of the sphincter with fingers during sphincteric divulsion for fissure in ano.
56. Sloughing of rectal tissue crushed by forceps during operation.
57. Fecal incontinence from sphincteric injury during Whitehead's operation.
58. Rectum perforated and ischiorectal abscess resulting from needle puncture made while injecting hemorrhoids with carbolic acid.
59. Injury to the rectum resulting in abscess from rectal massage for vesiculitis.
60. Torn sphincters from falling on a stick while scratching the anus.
61. Rectovesical fistula from injury caused while correcting an imperforate rectum.
62. Rupture of upper rectum during operation for lower abdominal adhesions. Perforation of urethra made while incising an abscess.
63. Punctured urethra terminating in recto-urethral abscess made during operation for anterior fistula in ano.
64. Urethral fistula from partial destruction of the urethra that occurred during perineal excision of the rectum for carcinoma.
65. Extensively injured rectum caused by the explosion of a glass high-frequency tube.

*Comments on the Author's Cases.*—The majority of anorectal injuries were encountered in the lower rectum, and age of the sufferers varied from infancy to seventy years. In 10 cases where wounds involved the peritoneum, bladder, or both, patients were dangerously ill, and 4 succumbed to the injury. In other instances where wounds were multiple, deep, or extensive pain was distressing preceding and during defecation, irritation accompanied evacuation of urine through the rectum or feces by way of the urethra, and the usual manifestations of sepsis were present when the wound

was infected. In the vast majority of cases of anorectal injury patients were comfortable following irrigation and drainage of the wound, and seldom developed annoying or dangerous symptoms unless the peritoneum or other organs were involved.

Few sequelæ were observed, and of these the following were the most important: stricture, partial or complete, fecal incontinence, rectovesical fistula, keloid, fecal fistula, artificial anus, pruritus, and fistula in ano.

In the majority of instances the patient was out of bed within less than a week following injury, but in some cases the wound required considerable time to heal.

## Chapter XII

### Papillitis—Hypertrophied Anal Papillæ

**General Remarks.**—Papillitis, a frequent and distressing anal condition, has not received the consideration it deserves.

Hypertrophied papillæ (Figs. 174, 175) are encountered almost daily by the proctologist, but are seldom diagnosed by general practitioners or surgeons, who often mistake them for skin-tags, polyps, or venereal warts.



Fig. 174.—Hypertrophied anal papillæ.

Anal papillæ are minute pointed or triangular dentations—ten to fourteen—located at the lower extremity of Morgagni's columns, upon the edges of the crypts situated at the mucocutaneous juncture (Fig. 176).

Papillæ are not always macroscopically visible except when hypertrophied and elongated, under which circumstances they are to be seen as glistening saw-tooth appearing projections with their base directed upward and inward when the anal margins are everted.

These diminutive elevations are composed chiefly of stratified epithelium and connective tissue, and each papilla possesses an arteriole and nerve filament.

Papillæ are tactile organs with a special rectal sense, and when this is destroyed by Whitehead's hemorrhoidal or other operation evacuations sometimes occur without a desire to stool having been induced.

One or several papillæ may be enlarged together with or independent of cryptitis. In either case they cause considerable distress, but never alarming symptoms or manifestations that would keep the patient from social or business duties unless he has an extremely nervous temperament.

Papillæ have been known to produce neurogenic disturbances and pain or discomfort in the back, bladder, or down the legs through local and reflex nerve—sympathetic—connection.

#### ETIOLOGY

Their *etiology* is easy in some and difficult to ascertain in other cases. Occasionally hypertrophy of anal papillæ is caused by traumatism of the anal canal incident to foreign bodies, expulsion of hard knotty feces, daily returning of protruded polyps, hemorrhoids or prolapsed gut, but in the majority of instances papillitis is induced by a chronic acrid discharge from a cancer, abscess, fissure, ulcer, proctitis, or encysted fish bone or other foreign substance.

In rare instances hypertrophied papillæ are secondary to the carbolic acid injection treatment of hemorrhoids, prostatic massage, long-continued strong topical applications, frequent and careless instrumentation, and daily introduction of rough or sharp enema or irrigating tubes. In fact, papillitis may ensue from daily acid stools or anything that keeps the mucosa of the lower anal canal constantly irritated.

#### PATHOLOGY

From a pathologic viewpoint papillitis is not very interesting, because enlarged papillæ are composed chiefly of normal tissue, but have a peculiar appearance owing to their saw-tooth-like shape, pink base, and whitish apex which is directed upward (Figs. 174, 175). Moderately enlarged papillæ do not change their shape or direction, but as they elongate and broaden at their attachment they project into the anal canal and are caught by the feces and bent downward.



Daily defecation, where the feces are hard, hastens their enlargement by stretching and traumatizing them, so that eventually they vary from  $\frac{1}{2}$  to 1 inch (12.7 mm.—2.54 cm.) or more in length, having a round pointed extremity and project ribbon- or worm-like through the anus. Protruding papillæ have a reddish hue, are not very sensitive, seldom become ulcerated, and owing to erectile tissue entering into their composition they gradually retract upward until released from the grasp of the sphincter muscle, a maneuver that induces crawling sensations in the rectum.

From what has been said the reader will understand that hypertrophied papillæ are frequently associated with hemorrhoids, fistula, ulceration, and other affections of the anal canal.

#### SYMPTOMS

While manifestations are confusing in some cases, they are sufficiently clear to cause the experienced proctologist to suspect them before the rectum has been examined.

Pruritus ani is the most persistent and distressing symptom of hypertrophied anal papillæ, and results from their gradually withdrawing themselves into the rectum following defecation. Some patients complain of crawling or tickling and pricking sensations above the anus induced by the tack-like projections or irritation from mucus which has increased through stimulation of the goblet cells.

Now and then tenacious mucus collects and causes erosion, irritation, and itching of the perianal skin.

Enlarged papillæ invariably cause an unrelieved feeling following defecation and puckering of the anus in mild and marked tonic or clonic spasm of the sphincter muscle in aggravated cases. Where contraction of the anal muscles continues from a few moments to hours *sphincteralgia* ensues and the patient suffers from inability to urinate, discomfort about the neck of the bladder, and intense pain in the sacrococcygeal region.

As long as papillæ are extruded through the anus they feel like live worms, the sphincter remains rigid, and pain continues, but immediately they have retracted or been pushed above the muscle these manifestations are modified or disappear.

Constipation may be the predisposing cause of or be induced by hypertrophied papillæ where the sphincter has become greatly thickened. Occasionally pruritus ani is intensified where Morgagni's crypts are inflamed, there is a hypersecretion of mucus from them or the pockets become plugged with fecal matter as feces are

driven through the narrow anal canal, a condition that favors the formation of an abscess and blind internal fistula.

Occasionally enlarged papillæ are caught and torn from their base by scybala, the rent assumes the characteristics of fissure in ano, and the patient complains of terrific sphincteralgia and streaks of blood upon the feces.

#### DIAGNOSIS

There is no reason for failing to make a diagnosis of or mis-making papillitis for other anorectal affections where the history



Fig. 175.—Markedly hypertrophied anal papillæ variable in length, size, and shape, as viewed through the author's anoscope.

has been taken, the anus inspected, and the anal canal examined with the finger and through the anoscope (Fig. 175). One should suspect papillitis where the patient complains of stickiness about the anus, crawling sensations in the rectum following defecation, spasmodic contractions of the sphincter, feeling as if the rectum

was not completely emptied by stool, and discomfort or pain in the vesical, sacrococcygeal, or sciatic regions.

Hypertrophied anal papillæ are readily brought into view when anal margins are everted or a Gant speculum or anoscope is introduced, because they project into the instrument or gradually retract into the bowel when extruded.

Papillitis has been mistaken for other rectal ailments, but most frequently they are confused with fibrous polyps, skin-tags, and venereal warts.

Papillæ are unlike polyps, since they have a pointed apex and broad base, while the latter possess a narrow pedicular attachment and broad, rounded, or club-shape extremity.

Skin-tags are differentiated by their lighter color, softness, and wrinkled appearance (Fig. 306). It is inexcusable for one to mistake venereal warts for papillæ because they are usually present in great numbers upon the skin and mucosa, have a narrow attachment and broad extremity, and show a tendency to collect and form conglomerate masses (Figs. 484, 485).

The distinguishing characteristics, however, of hypertrophied papillæ are their saw-tooth-like shape, broad pink base, and pointed whitish apex, varying length and irregular shape, and line of attachment at or in close proximity to the mucocutaneous juncture or Hilton's white line (Fig. 175).

#### TREATMENT

Topical applications to the anal mucosa may modify inflammation and reduce their size, but a cure is not to be expected until they have been destroyed.

Since papillitis is usually secondary to constipation or ano-rectal affection, complicating diseases must be considered when planning the treatment if it is to be curative.

Cryptitis very frequently complicates papillitis and crypts are cleansed and treated as often as required, or hooked up and removed with scissors along with inflamed papillæ when excised.

Following rectal irrigation and anesthetization by the injection of a few drops of eucain solution,  $\frac{1}{8}$  per cent. (Fig. 176), papillæ are quickly eliminated by catching and pulling them down with a tenaculum or forceps so that they may be *crushed*, and left to slough off or be destroyed by *fulguration*.

The author prefers to *excise* them with scissors under eucain anesthesia and suture or, preferably, let the wound heal by granulation (Fig. 177), or ligate them at their base and excise that portion external to the ligature (Fig. 178).

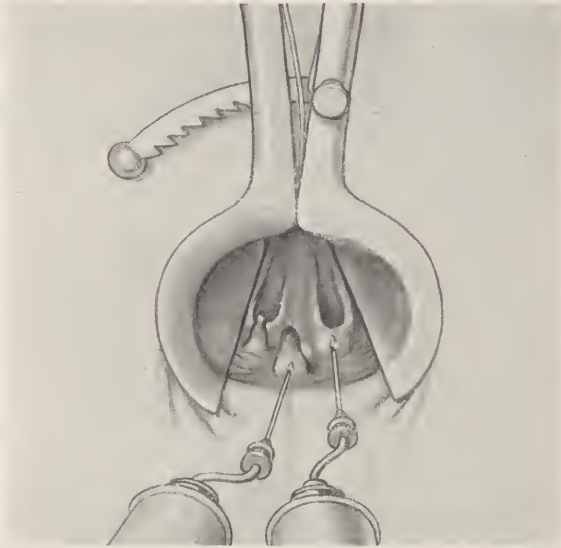


Fig. 176.—Anesthetization of a crypt (right) and anal papillæ (left).

Some surgeons close wounds made by the removal of papillæ with catgut, but the writer has found this objectionable because it

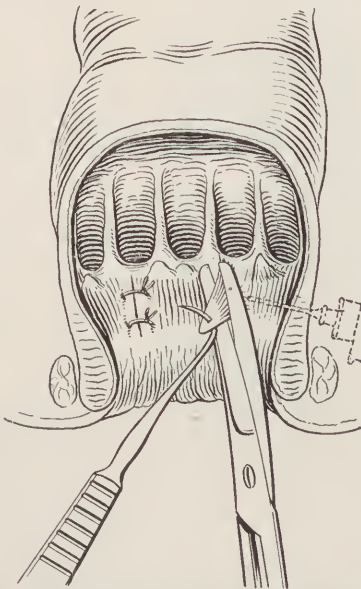


Fig. 177.—Method of excising papillæ and closing wounds with catgut under local anesthesia.

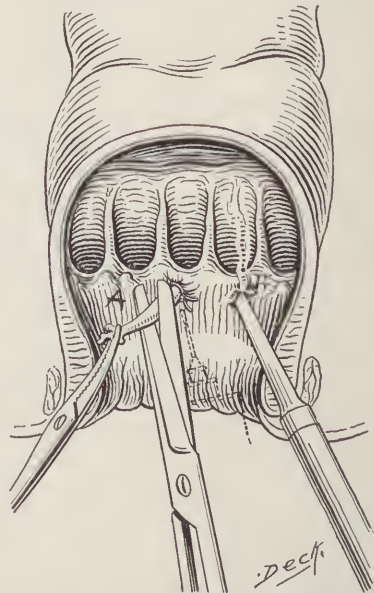


Fig. 178.—Removal of anal papillæ under local anesthesia: A, By ligation and excision; B, with Paquelin cautery.



takes longer, causes more suffering, and is sometimes followed by infection, breaking down of the suture line, or formation of an abscess or fistula.

Following these operations it is not necessary to confine the patient to his room for more than a day, if at all, restrict the diet, or control the stools further than to see that they are semisolid.

Later applications of ichthyol or balsam of Peru, 10 per cent., are indicated to stimulate healing of the wounds and a sedative ointment composed of vaselin, ʒj (30.0), containing cocain, gr. viij (0.53), and calomel, gr. xij (0.8), used through a pile-pipe, is employed to modify pain and spasms of the sphincter.

In aggravated and cases complicated by other anorectal affections it is sometimes advisable to divulse or divide the sphincter before removing enlarged papillæ.

## Chapter XIII

### Cryptitis

**Definition.**—Cryptitis is an inflammation of Morgagni's crypts—rectal pockets, semilunar valves.

This annoying rectal affection frequently complicates but is encountered less frequently than papillitis. Cryptitis may exist independently or complicate other diseases of the anorectal region.

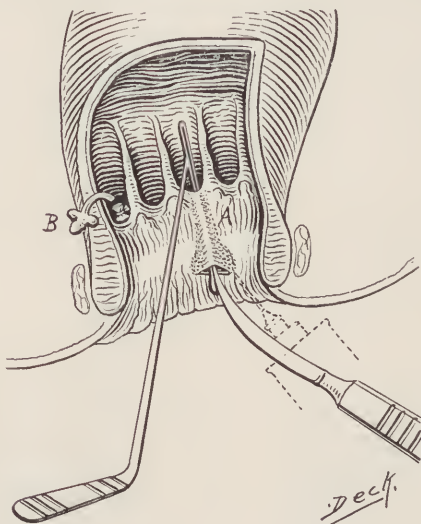


Fig. 179.—A, Crypt abscess being incised with aid of the author's angular grooved fistula director; B, shows polyp ligated and excised. Both operations performed under local anesthesia.

An understanding of the *anatomy* of Morgagni's crypts is necessary, otherwise their pathology will not be understood and a mistaken diagnosis will be made. Suspended between the lower extremities of the anorectal—Morgagni's—columns are several cup-like mucomuscular folds—*semilunar valves*—behind which the mucosa dips inward, forming crypts or so-called rectal pockets (Fig. 91), which possess an epithelial lining resembling that of the skin. Upon the lower margins of these crypts, *linea dentata*, the anal papillæ (Fig. 91) are located.

The function of Morgagni's crypts is not fully understood, but these pockets with the semilunar valves surrounding their outlets presumably secrete and collect mucus which is discharged during defecation to facilitate the passage of feces through the anus.

#### ETIOPATHOLOGY

The pathologic significance of rectal pockets is not appreciated except by trained proctologists, who realize that pain, itching, rectal uneasiness after stool, and other anal manifestations are frequently traceable to cryptitis, concealment within the pouch of a fecolith, seed, or other foreign body, ulceration of the semilunar valves, or discharge of pus from a fistula through the crypts.

Cryptitis is most often secondary to the accumulation of fecal matter driven into the pouch during defecation, which is difficult to evacuate because it hardens, and the crypt mouth is directed upward and tends to collect additional excrement, the pressure of and decomposition of foreign matter within the diminutive sacs cause irritation and pressure necrosis which, in turn, leads to *acute* or *chronic* cryptitis with or without ulceration. That causes additional irritation, augments the secretion of mucus, which in turn, excoriates the perianal skin.

If such cases are neglected hypertrophy of the anal papillæ and sphincter muscle ensues, the former causing distressing pruritis ani, and the latter, tenesmus or painful sphincter algia.

When foreign bodies or a foul discharge are permitted to remain in rectal pockets they ulcerate, infection takes place, abscesses or fistulæ form that discharge through an outlet in the crypt, rectum, or upon the buttocks near the anus.

Rectal pockets point upward and fish bones, pins, needles, seeds, and other narrow and pointed foreign bodies frequently lodge within them, and occasionally thread-worms, segments, or the eggs of other helminths have been discovered in dilated or ulcerated crypts.

The mucosa of these cup-like cavities with that of the rectum is occasionally involved by catarrhal inflammation or specific coloproctitis, induced by gonococci, Entamebæ hystolytica, dysenteric bacilli—Shiga's, Flexner's, Harris', or DuVall's—flagellates, Balantidium coli, tubercle bacilli, or coccidia. Rarely crypts are attacked by epithelioma or cylindric-celled carcinoma of the rectum.

Rectal pockets frequently become involved in the inflammatory and ulcerative process of varicosities within the anal canal, which accounts for the frequency with which internal hemorrhoids, cryptitis, and papillitis are associated.

Fistula may either result from or cause chronic cryptitis, hence in doubtful cases of anorectal irritation and pain rectal pockets should be examined to see if they connect with a sinus (Fig. 90).

Occasionally following distention of a crypt with mucus, feces, or gas its mouth becomes strictured or closed entirely, and a diverticulum is formed.

Under such circumstances annoying symptoms may be absent, but when diverticulitis or peridiverticulitis—cryptitis and pericryptitis—prevail they induce annoying pain and itching or other symptoms until the pocket has been freed from its irritating content by ulceration, formation of an abscess, or operation.

In cryptitis, pockets may show nothing except a highly colored, sensitive mucosa, but in aggravated cases the semilunar valves are enlarged, swollen, edematous or indurated, and extremely sensitive.

Once crypts become dilated, affording a lodging place for feces through frequent distention, they gradually increase in size or rupture, forming fissure in ano.

Occasionally a lengthy tear suddenly appears, but usually a fragment near the center of a crypt gives way and is stripped downward daily in hang-nail fashion by the feces until the tough integument is reached, the tear forming a typical *fissure in ano*, with its sentinel pile (Fig. 90).

Occasionally the semilunar valve and mucosa gradually relax and a considerable sized lip-like depression resembling the mouth of a small fish is produced, which remains partially or completely filled with feces. The edges of such a pocket may be round and indurated or degenerate, become fragile, and break off; it appears as a ragged circular ulcer.

Sometimes hypertrophied crypts and enlarged papillæ project into the anal canal and make diminutive grooves in the excrement during expulsion similar to that caused by small polyps.

#### SYMPTOMS

The manifestations of cryptitis and papillitis simulate each other, and it is difficult or impossible to differentiate between them except by inspection through an anoscope (Fig. 91). Dull, aching pain alone or accompanied by heaviness in the anal canal with or without sphincteralgia is the characteristic symptom of cryptitis.

Next in importance are attacks of itching at the anus not relieved by scratching. In aggravated cases accompanied by



sphincteralgia and contraction of the levator ani muscles sacro-coccygeal neuralgia, constipation, prostatic irritation, frequent micturition, and pain in the back or down the legs are troublesome manifestations. Intolerable itching, tonic contraction of anal muscles, continuous heavy pains, and obstipation prevail when a fecolith or foreign body is caught and when lodged in a crypt, but they cease following defecation, the offending substance has been evacuated during stool or removed otherwise.

Itching and pain are aggravated by defecation, but are quickly arrested by swabbing or washing inflamed pockets free of feces, discharge, or *débris*. Sudden sharp, shooting pains indicate spasmodic contraction of the sphincter, lodging of an acrid discharge, or foreign body within a pocket.

Annoyance and suffering is proportionate to the number of diseased crypts and nature of complicating anorectal affections.

Pain incident to cryptitis is augmented by firm or nodular stools, violent exercise, prolonged standing, horseback riding, and digital or proctoscopic examination. Sitting upon the knob of a chair or other oval object or making continuous pressure over the anus affords marked relief, and the application of heat soothes the part and relaxes the sphincter.

When pus from a fistula or abscess discharges through a crypt itching is intensified, mucosa and perianal skin are red and excoriated, and the anal margins are glued together.

While itching is annoying in cryptitis, this condition is rarely responsible for typical pruritis ani. This class of sufferers are nervous, respond readily to psychic impulses, and cryptitis is sometimes responsible for local reflex and functional disturbances from which they suffer—sensitive spine, indigestion, constipation, diarrhea, despondency, palpitation, and neuralgia in parts near and distant to the rectum. In many instances the author has seen the above and other manifestations quickly disappear following the removal of inflamed crypts, alone or with excision of hypertrophied anal papillæ.

Hypersecretion of mucus is a common symptom of cryptitis, and mucus may be seen glistening or as whitish films, threads, or masses upon the anus, mucous membrane, or perianal skin, and burning or stinging pain is usually induced by such mucoid collections.

#### DIAGNOSIS

When the history brings out some or all of the above symptoms cryptitis should be suspected, and each rectal pocket inspected,

tested with an angulated probe to ascertain if it is inflamed, ulcerated, enlarged, contains a foreign body, or serves as an outlet for pus being discharged from a blind fistula.

Such an examination is quickly and satisfactorily made with the aid of a flexible or rigid angulated probe (Fig. 181) and the author's tapering anoscope (Fig. 71) or examining speculum (Fig. 69) having a sliding window. Discomfort incident to instrumentation is minimized by the application of cotton pledgets soaked in cocain (10 per cent.), or injecting the crypts with a  $\frac{1}{8}$  of 1 per cent. eucain solution.

The sphincter muscle may be desensitized in the same way, but infiltration is sometimes objectionable because it obscures the pockets.

Normal and enlarged papillæ are of assistance in locating crypts, since they are situated upon the lower margins of the semilunar valves (Fig. 174) or entrances to them.

Following inspection and probing of rectal pockets the rectum and perianal parts are palpated and compressed (Figs. 47, 48), for when an indurated tract is detected running toward the crypt or pus can be squeezed out of it the pocket is connected with an abscess or blind fistula.

Introduction of a probe into a normal crypt induces but slight discomfort, but its passage into an inflamed pocket causes an intense, sharp, shooting pain like one would expect from touching an exposed nerve.

After making a diagnosis of cryptitis one should thoroughly examine the anorectal region to determine if there are other complicating lesions.

#### TREATMENT

Mild cases of cryptitis are sometimes cured by regulating the stools and cleaning and making topical applications to inflamed crypts. Pockets are readily exposed through the author's anoscope or examining speculum (Figs. 69, 71) and irrigated with a dental syringe containing warm water or an antiseptic solution, after which they are swabbed with pure ichthyol or a 10 per cent. silver nitrate solution.

Caustics and acids are contraindicated, since they frequently cause sloughing of healthy tissue.

When the anal canal is excoriated the lower rectum is flushed daily following stool with a warm mild 2 per cent. ichthyol, boric acid, or permanganate of potassium solution to heal it, and a hot 4-ounce olive oil enema containing  $\frac{1}{2}$  dram of bismuth subnitrate

is injected into the bowel nightly to soothe the mucosa and lessen sphincteric irritability.

**Surgical treatment** is indicated in the majority of cases because palliative measures are often ineffective, since enlarged anal papillæ,

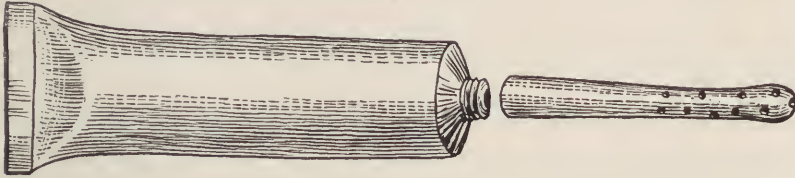


Fig. 180.—Author's ointment applicator, useful for applying soothing salves to inflamed crypts where the sphincter is irritable and contracts, causing defecatory pain.

hemorrhoids, fissure, or other surgical lesions cause or complicate cryptitis.

General anesthesia is unnecessary in the removal of diseased crypts, which can be excised and other necessary work done follow-

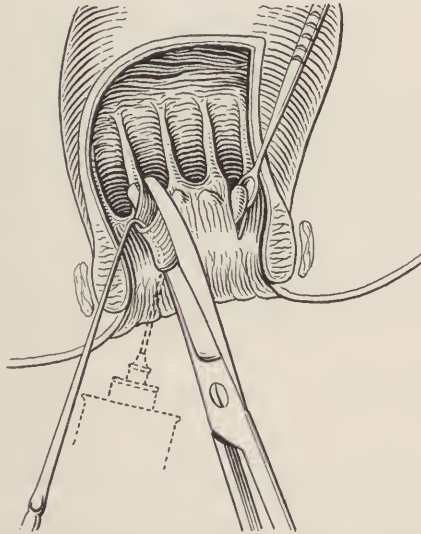


Fig. 181.—Cryptitis. Excising inflamed crypt under local anesthesia with aid of blunt hook and scissors.

ing infiltration of diseased tissues with a  $\frac{1}{8}$  per cent. eucain solution. Overdistention of the tissues with the anesthetic should be avoided otherwise the pockets may be obliterated by the anesthesia.

The author's technic for excising crypts consists in lifting each pocket well up with his rigid angulated probe (Fig. 181)

and removing it with one snip of the scissors; after all diseased crypts have been removed bleeding is controlled by inserting a small gauze plug into the wound through the anoscope.

Where there is cryptitis and enlargement of anal papillæ both pockets and papillæ are simultaneously removed with a diamond-shaped flap of mucosa, to which they are attached, or dissecting them out, using elliptic incisions (Fig. 181) and scissors (Fig. 182).

In either case the wound may be closed with catgut sutures or, preferably, drained, and allowed to heal by granulation to avoid possible infection and forestall pain. Splitting inflamed crypts as advised by some surgeons is inadvisable, as the procedure

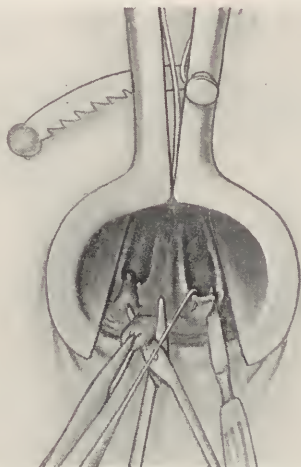


Fig. 182.—Removing an inflamed crypt (right) and excising hypertrophied papillæ (left) following infiltration with eucaïn.

leaves unnecessary flaps of inflamed tissue to continue the irritation.

The gauze plug is removed in a few moments when bleeding has been arrested, and the patient is not confined to bed unless he prefers it, since he is given a sedative ointment or suppository containing morphin, cocain, and belladonna, which keeps him comfortable and prevents sphincteric spasms, and is permitted to decide whether he goes home or to the hospital.

The author's patients are permitted a regular diet, and no attempt is made to regulate the stools unless they show a tendency to become hard, in which case a laxative is prescribed to keep them soft, because both fluid and constipated evacuations increase suffering.



It is hardly necessary to add that complicating diseases of the rectum or anus are radically treated at the same time, otherwise a complete cure cannot be anticipated.

**Comments.**—The author has successfully treated 200 cases of cryptitis, and postoperative sequelæ have not occurred in a single case.

Cryptitis and papillitis were associated in 50 per cent. of the cases; proctitis, ulceration, and fissures were very frequent complications; cryptitis alone was encountered in only 20 per cent. of the cases.

Weeks or months were required to heal inflamed crypts in neglected cases by palliative measures because the semilunar valves were indurated or the pockets were ulcerated or acted as a reservoir for feces and foreign bodies. Following *cryptectomy* an average of two weeks was required to completely heal the wound.

Where fistula connected with the pocket the operation was more extensive and convalescence longer, but in either case it was seldom necessary for the patient to remain in bed more than a day if at all.

## Chapter XIV

### Sphincteralgia—Spasm of the External Sphincter

**Definition.**—Sphincteralgia is a condition characterized by sudden, violent, rigid, and painful involuntary contractions of the anal sphincter (Fig. 183). Spasmodic or *alternate contraction and relaxation* is designated *clonic* and *prolonged contraction* of the anal muscle *tonic* spasm of the sphincter. Sphincteralgia is frequently encountered by proctologists, but internists and surgeons often mistake and incorrectly treat this distressing ailment for different diseases common to the anorectal region.



Fig. 183.—Tightly contracted anus caused by sphincteralgia relieved by incising the muscle under local anesthesia.

Sphincteric spasm may come on suddenly without warning, when the rectum is healthy or diseased, continue for a moment or hours, recur several times daily or at longer intervals, and cause slight annoyance, drawing or puckering sensations, or induce continuous dull agonizing pain located in the lower rectum, prostatic or sacrococcygeal region, or limbs.

These sufferers are extremely nervous and rendered unfit for business or social duties during an attack, and no other anorectal ailment except fissure produces anything like as much suffer-

ing as sphincteralgia, which may be incited by foreign bodies, slight or serious lesions near the anus.

The author has treated a number of patients thus afflicted who threatened to commit suicide if they were not promptly relieved. Since lesions responsible for sphincteric spasms are usually of minor importance and easily corrected they should be immediately cured and unnecessary suffering prevented. Unfortunate results often follow operation in this class of cases because the symptom sphincteralgia is mistakenly diagnosed and treated for one of the more common anal diseases.

#### ETIOLOGY

There are many causes of sphincteralgia, and often the real factor behind it is not suspected because it is reflex, secondary to disease in a neighboring structure, organ or viscus, or located distant to the bowel. In most instances spasm of the anal muscle is incited by an irritant or lesion within or in close proximity to the anus, but it may ensue from a congenitally defective or hypertrophied sphincter muscle.

Sphincteralgia may be induced by the passage of hardened feces when the rectum is normal or come on during or following defecation where there are lesions within the anal canal that are daily torn or bruised through the evacuation of the excreta. When the lower rectum is sensitive, inflamed, or otherwise diseased slight or severe spasm of the anal muscle may be brought on by coughing, sneezing, laughing, walking, urination, sitting down, or scratching, and when the anus is very irritable sphincteralgia has been known to follow fright, worry, and psychic impulses and voluntary contraction of the muscle. In a number of the author's cases *sphincteric* have been associated with spasms of the *levator ani muscle* secondary to constipation with recurring rectal fecal impaction or uterine, prostatic, urethral, or vesical disease. The following, enumerated in the order of their importance, are the most frequent causes of sphincteralgia: fissure in ano, anorectal ulcers, hemorrhoids, polyps, catarrhal and specific proctitis, papillomata, fistula, cryptitis, papillitis, intestinal parasites, hyperesthesia of the rectal mucosa, diminutive seeds, fish bones, fecoliths and other foreign bodies, diverticula, fecal and gas cysts, anterior deviation of the coccygeal tip, hairs at anal margin, perianal skin lesions, submucous and tegumentary abscesses, crabs and lice, pederasty, and accidental injury to the anorectal region.

*Fissure in ano* is more frequently responsible for sphincteralgia

than other rectal affections, and in such cases pain is post-defecatory, continuously agonizing, lasts from a half-hour to two hours, and is most pronounced in the coccygeal region, though occasionally considerable discomfort prevails about the neck of the bladder and in the limbs or heel.

*Ulcers of every type* located in the anal canal that become irritable and sensitive induce slight or severe spasms of the anal muscle owing to their being daily traumatized by feces during stool.

Sphincteralgia incident to fissure and ulcers is severe while it lasts, but when the muscle relaxes and pain is relieved it seldom recurs until the next defecation.

*Protruding internal hemorrhoids* frequently incite drawing or puckering at the anus, but seldom cause annoying sphincteralgia, except when the tumors are caught or strangulated within the grasp of the anal muscle.

*Inflamed cutaneous hemorrhoids* are usually complicated by rectal tenesmus, but are seldom responsible for sphincteralgia.

*External thrombotic hemorrhoids* induce puckering in the beginning and marked contraction of the sphincter later, which continues until the contained blood-clot has been evacuated or absorbed.

*Anorectal wounds*—caused by accidental injury, careless introduction of an enema tube, instrument, finger or hand, or an operation—that are sensitive or refuse to heal sometimes induce tonic and clonic spasms of the anal muscle.

*Affections of the bladder, prostate, and urethra* because of close proximity to the anus occasionally stimulate the sphincter to abnormal contraction.

*Brain and spinal cord centers, controlling the rectum* when injured or diseased, may induce sphincteralgia or sphincteric paralysis. *Constipation* and *obstipation* are frequently responsible for this condition, because they favor repeated accumulation of large and small firm and scybalous fecal masses that irritate the lower rectum or lacerate the mucosa and stimulate sphincteric contractions.

*Thread-worms* caught in anal mucous or skin folds invariably cause intense itching and occasionally incite sphincteralgia.

*Foreign bodies, seeds, small bones, and fecoliths* that lodge in a crypt, ulcer, or beneath the mucosa, or become encysted nearly always induce sphincteric uneasiness or spasms.

*Enlarged anal papillæ, cryptitis, diminutive polyps, anal fistula, and lesions* causing a discharge that irritates the mucosa or musculature are often responsible for sphincteralgia.



## PATHOLOGY

Since sphincteralgia is a symptom and not a disease, it has no individual pathology, and changes seen in such cases are those of the disease or irritation causing it. No lesions are observed where sphincteric spasms are incited by spinal cord or brain disease or injury, psychic impulses, or neurogenic disturbance. The mucosa of the anal canal may remain normal or appear congested when intestinal worms cause sphincteric irritation, and foreign bodies, except when caught in folds of the mucosa or they become encysted, do not cause lesions or other inflammation of the mucous membrane.

*Fecal impaction from constipation and obstipation*, where hardened feces frequently collect in the rectum, often causes inflamed areas and stercoral ulcers.

*Hemorrhoids*, responsible for sphincteric irritation and contraction, usually appear as highly inflamed skin-tags; firm, sensitive, oval, dark bluish swellings at the anal margin, protruding or strangulated large reddish tumors.

*Fistulæ*, responsible for sphincteralgia, are usually of the blind internal type, having an opening in the posterior median line at the juncture of the external and internal sphincter muscles.

*Polyps* that induce sphincteralgia are usually of considerable size, have a long pedicle, and irritate the sphincter by dangling within the anal canal or extruding through the anus.

*Cancer* and *stricture* seldom incite contractions of, but frequently induce relaxation or paralysis of, the sphincter ani.

## SYMPTOMS

The manifestations of sphincteralgia are few; in the average case the patient first feels a sensation of uneasiness at the anus, then tightening about the anal canal, and finally, rigidity of the sphincter muscle. In the meantime suffering has gradually increased from a slight discomfort to a dull, agonizing, continuous pain, is felt principally in the coccygeal region, about the neck of the bladder and down the limbs as far as the heel, and during sphincteric spasms the sufferer is more comfortable while standing or walking. When this condition is secondary to bowel lesions symptoms of the disease causing it are present in addition to those of sphincteralgia.

## DIAGNOSIS

Sphincteralgia is diagnosed easily, but the cause behind it may be difficult to discover. When a patient complains of symp-

toms just enumerated, the anus is tight or sphincter is rigid, making it extremely difficult to introduce the finger, speculum, or proctoscope, a diagnosis of sphincteralgia is justified, particularly when the lower rectum is drawn upward and entrance to the anus is funnel shaped.

#### TREATMENT

The symptom *sphincteralgia* induces the most intense suffering of any anorectal ailment or disease, hence measures should be



Fig. 184.—Fissure being treated with sedative ointment to encourage healing of lesion and relieve sphincteralgia.

taken to relieve it immediately, and afterward the irritation or affection inducing it can be removed or cured. Intense sphincteric spasm is arrested in a few moments by administering a hypodermic injection of morphin, gr.  $\frac{1}{4}$  (0.016), and atropin sulphate, gr.  $\frac{1}{150}$  (0.000432), and less quickly by introducing a suppository composed of morphin or cocain, gr.  $\frac{1}{4}$  (0.016), and belladonna extract, gr.  $\frac{1}{4}$  (0.016), but when relief does not follow promptly a second injection or suppository may be administered after one hour. In case

pain is not severe it may be controlled by an enema of hot oil, ℥iij (90.0), a sitz-bath, or application to the anus of a bag filled with hot water or salt.

In the majority of instances sphincteralgia is *post-defecatory* and is prevented by freely using the following ointment through the aid of a hard rubber or metal pile ointment applicator (Fig. 184) immediately following defecation:

R. Morphin sulphate.....	gr. viij	0.53;
Belladonna ext.....	gr. x	0.6;
Lanolin.....	℥j	0.3.—M.

Sig.—Apply daily after stool and when the sphincter is contracted.

More satisfactory and quicker results are obtainable when heat is employed in conjunction with these remedies. Since spasm

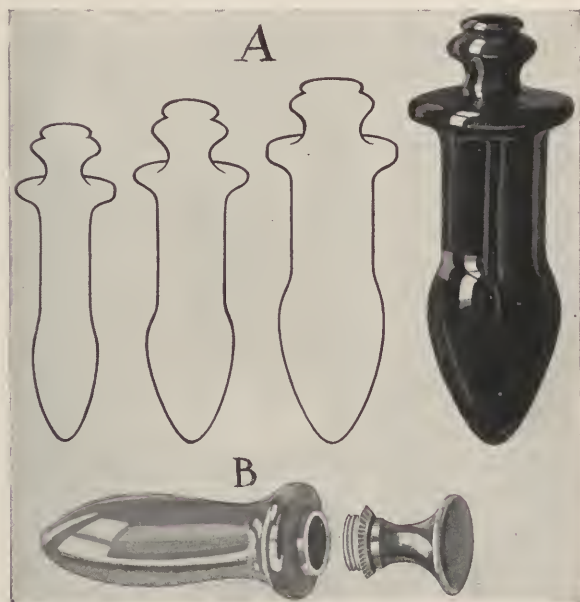


Fig. 185.—Self-retaining anal dilators: *A*, Young's; *B*, Pratt's, which can be filled with hot or cold water, sometimes employed in the treatment of chronic sphincteralgia.

of the anal muscle is often due to the evacuation of hardened feces, mineral oil, a laxative or soothing enema is administered as often as required to soften feces, lubricate the bowel, and procure non-irritating daily evacuations.

To permanently relieve and prevent sphincteralgia the bowel must be cleared of foreign bodies, fecal accumulations, acrid discharges, and other irritants: fissures, ulcers, hemorrhoids, cancer,

stricture and other lesions responsible for sphincteric spasms must be cured; in addition, neurogenic disturbances must be corrected and the mental state of the patient improved through the aid of medication and psychotherapy.

*Gradual*, with anal dilators, or *forcible divulsion*, using thumbs or fingers, under local anesthesia, is often helpful in annoying sphincteralgia.

*Division* of the muscle under infiltrated anesthesia, as shown in fissure operations (Figs. 199, 201), requires but a moment and promptly relieves sphincteric contractions and defecatory pain. The cut is drained like superficial fistula wounds.



## Chapter XV

### Fissure in Ano—Painful Ulcer

*Anal Fissure*—from the Latin *fissura*, cleft or chap—is a slit-like ulcer located at the posterior anal commissure within the grasp of the sphincter muscle characterized by stinging during and agonizing pain and sphincteric contractions following defecation.

**General Remarks.**—On account of intense pain caused by it fissure in ano (Fig. 187) has frequently been designated *painful ulcer*, a term used synonymously by the author in the following discussion.

The medical profession is greatly indebted to Paré, Boyer, and Bodenhamer for pointing out the frequency, cause, symptomatology, and outlining the treatment of anal fissure, but modern proctologists have added greatly to our knowledge of the affection.

Fissure in ano is encountered in about 20 per cent. of all anorectal affections, causes more suffering than any other disease, and pain and reflex disturbances from it are out of all proportion to size of the lesion, but, fortunately, when properly treated a cure is always accomplished with slight discomfort to the patient. Fissures occur among the idle rich and laboring classes at all ages—particularly middle life—and in both sexes, though women suffer from them more frequently than men.

Typical fissures are pointed above, wider and rounded below—racquet shaped—usually single, parallel the long axis of the bowel, and are located at the posterior anal commissure in 95 per cent. of cases (Figs. 186, 187). Women are afflicted with multiple lesions more often than men, and rents are usually located in the anterior and posterior anal commissures, but may be encountered at the sides of the anus.

Painful ulcers—fissures—vary from  $\frac{3}{4}$  to 1 inch (19.05 mm.—2.54 cm.) in length, may be superficial or deep, acute or chronic and appear as clean-cut slits in the anal mucosa, beneath which, fibers of the sphincter muscle are sometimes seen crossing at a right angle (Fig. 191).

Often cracks, superficial tears, skin lesions, ulcers, chancres, and chancroids at the anal margin are mistaken for fissures in ano owing to their elongated or slit-like appearance, but such lesions do not usually induce sphincteralgia, hence fissures that

cause paroxysmal contraction of the anal muscle are designated as *true*, and those that do not are classified as *false*. From a therapeutic standpoint any lesion causing sphincteralgia located within the grasp of the sphincter muscle should be regarded and treated as a typical fissure.

#### ETIOLOGY

The most important **predisposing** causes of fissure in ano are: narrow anal canal, gormandizing, lack of water drinking, restricting the diet to foods that leave a

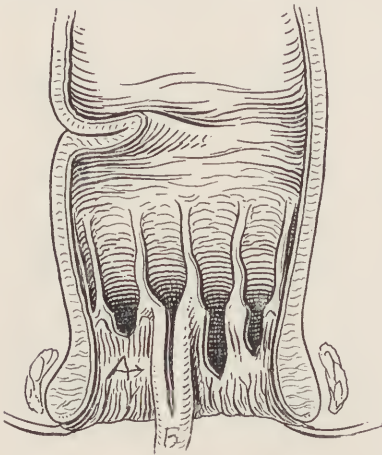


Fig. 186.—Fissure in ano caused by laceration and dragging down of an anal crypt: *A*, Fissure, on the left of which is a normal crypt, and to the right are two crypts, one slightly and the other considerably lacerated; *B*, characteristic sentinel pile—inflamed skin-tab below the rent.

large, coarse residue, fecal acidity, intestinal worms, diarrhea, acrid gastro-intestinal discharges, catarrhal and specific proctitis, congenital deformities of the anus or rectum, stricture, cancer, hemorrhoids, polyps or rectal procidentia that stretch the sphincter, varicosities, and other anorectal diseases, accompanied by irritable discharges that induce straining, keep the mucosa inflamed, or cause the formation of pus. Constipating medicines and insoluble chemicals, like bismuth, that form enteroliths, are also contributing factors in anal fissure.

Atrophic proctitis favors the production of fissures because the mucosa is dry and readily cracks superficially when traumatized.

The most frequent cause of fissure in ano is *constipation* and the evacuation of hardened feces. Small or large scybala or *impacted* fecal masses produce fissure by making a rent in the mucosa during their expulsion (Fig. 187) or by lacerating semilunar valves—crypts—the edges of which project into the bowel, and are torn further downward daily by feces, hang-nail fashion, until the skin is reached (Fig. 186). Rents formed in this way are associated with and concealed by so-called *sentinel piles*—skin-tags—composed of inflamed skin located at the lower extremity of the tears. Sentinel piles (Fig. 190) are usually seen in connection with painful ulcer, but the author has treated many typical fissures where they were not in evidence. Inflamed tags or swollen skin edges are frequent

complications of other anal lesions, and must not be mistaken and treated for sentinel piles that invariably conceal a fissure.

Occasionally sentinel piles are not seen until days or weeks following formation of fissure and development of sphincteralgia, but when present the rent can be exposed by everting infolded skin edges.

**Direct Causes.**—Below the author has enumerated in order of their importance direct causes of fissure in ano, some of which are frequent and others rare factors in this painful affection: *Constipation, fecal impaction and evacuation of hardened feces, tearing of crypts, careless digital and instrumental examination, unhealed wounds, foreign bodies swallowed or introduced through the anus, passage of the head during confinement, ignorant use of delivery forceps, injuries, anorectal operations, divulsion of the sphincter with fingers or instrument (Fig. 101, C), pessaries, careless introduction of enema tubes or imperfect syringe nozzles, prostatic massage, pederasty, and rectal masturbation—onanism.*

The anatomic arrangement of the sphincter favors the formation of painful ulcer because most muscle-fibers of one side of the anus do not decussate with those of the other, but pass directly backward to the coccyx (Fig. 188), which weakens the anus at the posterior commissure, the usual site of *fissure in ano*. Wallace believes fissure is incident to poor circulation of the anal mucous membrane which undergoes changes owing to the passing over it of feces.

Boyer maintained that fissure is caused by spasmodic contraction of the sphincter, but he believes that sphincteralgia is secondary to and caused by the irritable rent in the mucosa made in some other way.

#### PATHOLOGY

Fissures may be located *above*, within the grasp, or *below* the sphincter, but the first and last are *false* fissures, since they do not induce sphincteralgia, and are usually secondary to atrophic and ulcerative proctitis, skin or venereal lesions, while false ulcers are multiple and usually located at the sides of the anus, true fissures are single and situated in the posterior median line at the mucocutaneous juncture—Hilton's white line (Fig. 186).

The appearance of painful ulcers varies with their duration and degree of trauma sustained; when acute, their edges are clean cut, sharply defined, thin, pliable, and resemble fresh knife wounds, bleed slightly, are not sensitive, the color of the mucosa is normal, and the sphincter muscle is not irritable.

Under favorable circumstances fissures heal promptly, but they are usually bruised, torn open, and exposed to infection daily by feces, and become inflamed, sensitive, and incite paroxysmal or tonic sphincteric contractions responsible for the agonizing pain that typifies painful ulcer.

In neglected cases fissures are exceedingly sensitive to touch, their edges are pinkish, thickened and indurated or edematous,



Fig. 187.—Fissure in ano.

and remain separated when the sphincter relaxes, and tightly approximated when it contracts. The skin and mucosa adjacent to the lesion is congested or marked by erosions caused by the seropurulent discharge.

Occasionally the edges of fissures are undermined incident to infection or diminutive abscesses form beneath them, particularly at their lower extremity.

Infection beginning here frequently extends and terminates in



the formation of submucous, subcutaneous, or ischiorectal abscess and fistula (Fig. 191).

**Chronic fissures** are grayish in color and often surrounded by connective or scar tissue, which gives their edges a whitish oval appearance (Fig. 187), and the sphincter muscle is markedly hypertrophied and keeps the anus tightly closed. Occasionally the levator ani muscle is irritable, contracts, and draws the lower rectum upward, giving an infundibuliform appearance to the anus.

Sentinel piles, associated with fissure, caused by the tearing down of anal crypts, are inflamed, red, swollen (Fig. 186), and resemble skin-tags when lesions are in a quiescent state or have partially healed, when they have a thin web-like covering except at the upper extremity, which resembles the opening of a fistula, and cracks parallel with the bowel when an attempt is made to separate the anal margins.

When the discharge is abundant and acrid it may induce cryptitis, papillitis, pruritus ani, hypertrophy of radiating anal skin folds, diminutive polyps, pale, flabby granulations, or erosions in the perianal skin.

#### SYMPTOMS

Fissure causes more excruciating pain, local and reflex disturbances, than any other anorectal affection, and persons thus afflicted are poor sleepers, extremely nervous, and unfit for social or other duties.

Several of the author's robust and otherwise healthy patients claimed they could no longer endure the agony that accompanied and followed defecation, and threatened to commit suicide unless they were promptly relieved.

Painful ulcer does not materially disturb the general health, and individuals suffering from fissure obtain little or no sympathy because of their healthy appearance, and often are unjustly credited with being hysteric or magnifying their suffering.

There are *two stages* of fissure in ano: The *first* begins with *formation of the rent*, and lasts until the beginning of *sphincteralgia*, the *pathognomonic* symptom of fissure, which marks the onset of the *second* or painful stage of the disease.

The chief manifestations of fissure in ano (painful ulcer) are:

1. Pain.
2. Sphincteralgia.
3. Constipation and fecal impaction.
4. Hemorrhage.
5. Discharge.
6. Excoriation of anal mucosa and skin.
7. Infundibuliform anus.
8. Proctitis.

- |  |                               |
|--|-------------------------------|
| 9. Pruritus ani.                             | 12. Reflex disturbances.      |
| 10. Flatulence.                              | 13. Nervousness, melancholia. |
| 11. Change in the character of<br>the feces. | 14. Cryptitis and papillitis. |
|  | 15. Polypi and vegetations.   |

**Pain.**—At the time the tear is made pain is lancinating and later stinging or burning in character, but during the *second* or stage of sphincteralgia it is slight during and agonizing following defecation.

Fissure patients are fairly comfortable in the intervals between stools, but after an evacuation paroxysmal contractions of the sphincter first cause puckering of the anus, and then heavy, aching pain in the lower rectum and sacrococcygeal region, which gradually increases until it becomes agonizing, completely incapacitating the patient for work; at such times there may be spasmodic or tonic contractions of the anal muscle that last from a few moments to several hours, which eventually cease, leaving the patient comfortable until he sneezes, coughs, sits down, or has another evacuation.

**Sphincteralgia** is the manifestation dreaded by this class of sufferers, for when long-continued, excruciating pain is felt at the anus, neck of the bladder, down the legs, at the heel, or in the sacrococcygeal region, it becomes almost unendurable and continues irrespective of the position assumed by the patient until the sphincter relaxes.

**Constipation and Fecal Impaction.**—Constipation is the most frequent cause of painful ulcer and is a prominent symptom of fissure, however caused, for patients thus afflicted postpone going to stool as long as possible because of the intense suffering which accompanies or follows the evacuation of semisolid or firm feces.

**Hemorrhage.**—Bleeding is occasionally copious immediately following laceration of the mucosa or tearing down of crypts, but subsequently hemorrhage is unimportant. Stretching of the fissure during stool causes the loss of a few drops of blood which appears as a long streak upon solid or bright red droplets in fluid or mushy feces. When a patient loses considerable blood it is a sure sign that he is also afflicted with hemorrhoids, ulceration, cancer, or some other anorectal affection.

**Discharge.**—In the beginning the rent is filled and adjacent mucosa covered with serum that causes slight discomfort, but later the secretion becomes abundant and seropurulent, causing erosions in the skin and mucosa, and occasionally causes infection that terminates in abscess or fistula, the discharge from which

may be slight or profuse, but is thick, yellow, and has a disagreeable odor (Figs. 189–191).

**Excoriation of Anal Mucosa and Skin.**—Bathing the mucosa and skin with the acrid discharge from fissure causes them to become inflamed, sensitive, and excoriated, which augments pain and induces pruritus ani.

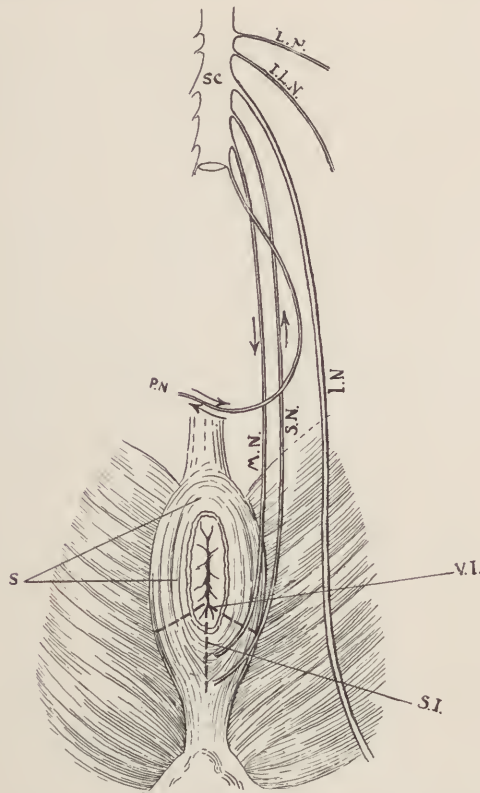


Fig. 188.—Nerves affected in fissure in ano responsible for sphincteralgia and incisions employed when incising the anal muscle: S, Sphincter; S.C., spinal cord; L.N., lumbar nerve; I.L.N., ileolumbar nerve; N.I., ischiatic nerve; S.N., sensory nerve; M.N., motor nerve; P.N., pudic nerve; S.I., incision employed when the sphincter is split posteriorly, and V.I, V-shaped incision practised when the muscle is divided on either side of the fissure.

**Infundibuliform Anus.**—When the levator ani muscle is irritable it spasmodically contracts and draws the lower rectum upward when the patient sneezes, coughs, strains, or defecates, giving to the anus an infundibuliform appearance.

**Proctitis.**—Catarrhal proctitis may precede or be induced by fissures, accompanied by a discharge that irritates the lower bowel, and the rectal mucosa is sometimes inflamed, the result of medi-

cated enemata, topical applications made to the lesions, or evacuation of hardened feces that traumatize the rectum.

**Pruritus Ani.**—Annoying pruritus about the anus is a frequent symptom of fissure. When itching is mild it may be due to the discharge, but when tantalizing it is usually induced by a seed, fecolith, or foreign body caught in the rent, and continues until it has been removed.

Pruritus of the perianal skin is caused by the mucopurulent secretion from the fissure, and in chronic cases radiating skin folds and adjacent integument become inflamed and thickened, which, in turn, leads to impairment of the circulation and entangling of nerve filaments, with the result that itching continues after the fissure responsible for it has been cured.

**Flatulence.**—Fissure patients generally complain of flatulence due largely to reflex digestive disturbances, constipation, and accompanying fecal impaction which blocks the bowel and prevents gas from escaping.

**Change in the Character of the Feces.**—Preceding an evacuation feces collect in the ampulla in a putty-like mass, and during defecation are driven through the narrow anal canal during defecation, which determines their form. The anal canal is surrounded below by the external sphincter and crossed above by the levator ani. These muscles are irritable in fissure cases and contract paroxysmally during defecation, resulting in feces being evacuated in numerous chopped off pieces, or as long, round or flat pencil or tape-like strings or strips unless long retained, when the excrement resembles sheep dung.

**Reflex Disturbances.**—Discomfort in the deep urethra, frequent micturition, inability to void urine, pain in the uterus, ovaries, bladder, prostate, testicles, back, legs or heel, and reflex digestive disturbances frequently complicate fissure in ano.

**Nervousness and Melancholia.**—Nervousness is characteristic of painful ulcer, owing to inability of the patient to sleep, suffering endured, fear that the lesion is incurable, and auto-intoxication from constipation and fecal retention.

Melancholia is an occasional symptom and results from prolonged suffering, rectal stasis, absorption of toxins, and pain incident to treatment; these sufferers sometimes threaten to destroy themselves unless quickly cured.

**Cryptitis and Papillitis.**—Sometimes anal crypts and papillæ are inflamed, the result of fissure, owing to bathing of the mucosa with a mucopurulent discharge or squeezing of them by the sphincter.

**Polypi and Vegetations.**—Prolonged irritation of mucosa and



skin by the discharge may lead to hypertrophic changes in and growth of diminutive polyps in the anal canal and formation of warts—vegetations on the perianal skin.

**Miscellaneous Symptoms.**—In addition to the above, individuals afflicted with chronic fissure in ano suffer from other manifestations—*pinched expression, careworn appearance, emaciation, sallow complexion, inability to concentrate the mind or remain long in one position, insomnia, anorexia, burning sensation in the rectum, straining during defecation, feeling as if something gives away during stool, and manifestations of chronic, rectocolonic stasis, with auto-intoxication.*

#### COMPLICATIONS AND SEQUELÆ

The most frequent complications and sequelæ of fissure and operations for its relief are hypertrophy of the levator ani and

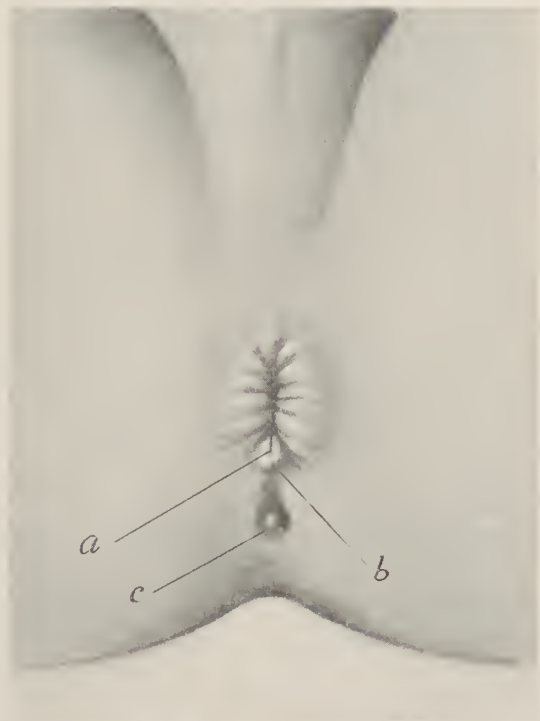


Fig. 189.—Fissure in ano complicated by abscess: *a*, Fissure; *b*, sentinel pile—inflamed skin; *c*, abscess connected with fissure by blind fistula.

sphincter muscles, urethrovesical irritation, marginal and deep abscesses (Fig. 189), fistula, pruritus ani, stricture, skin-tags, fecal

incontinence, painful defecation, constipation, and unhealed operative wounds.

The author has observed fissures complicated by the above conditions and associated with internal and external hemorrhoids, polypi, catarrhal and specific proctitis, stricture, cancer, coccygeal displacement, chancroids, venereal warts, pruritus ani, helminthiasis—thread-, tape-, and round-worms—ulcerative colitis, fistula, abscess, cryptitis, papillitis, congenital deformity, foreign bodies, and accidental anorectal injuries.

#### DIAGNOSIS

There is no excuse for failing to diagnose fissure in ano except when associated with anorectal affections, for persons thus afflicted relate similar histories and complain of the same symptoms, stating that during the expulsion of hardened feces something gave way causing lancinating pain and a slight bleeding, and that they subsequently suffered from painful defecation, spasmodic contractions of the sphincter, and agonizing post-defecatory pain located at the anus, sacrococcygeal region, or in the limbs, and reddish streaks or drops of blood on the feces.

With such a history a tentative diagnosis of painful ulcer is justified, but a positive diagnosis must not be made until the anus has been inspected and the lower rectum examined digitally and through the anoscope. Manipulation of the parts causes sharp pain unless gently accomplished, and careless introduction of the finger, speculum, or proctoscope is inexcusable in these cases.

With patient in the exaggerated Sims' posture the lesion is easily exposed by separating the anal margins or edges of the sentinel pile (Fig. 190), and painful ulcers located at the anterior commissure in women are brought into view by introducing the finger into the vagina and everting the lower rectum.

The speculum, anoscope or proctoscope, and digital examination are not always necessary for diagnosing fissure, but are of assistance in determining whether or not painful ulcer is complicated by hemorrhoids, ulceration, fistula, or other lesion, and under no circumstance are they employed until the fissure has been anesthetized with a pledget of cotton saturated in eucain (10 per cent.) or a few drops of the solution ( $\frac{1}{8}$  per cent.) has been injected beneath its base.

Fissure in ano is easily distinguished from other ulcers by the finger, which detects the sensitive slit-like depression hidden by the sentinel pile (Fig. 190); its location can also be ascertained.

through palpating the anus, which causes sharp pain and anal retraction when the sensitive spot is touched.

In aggravated cases when patients attempt to strain downward the anus is immediately drawn upward by the irritable levator ani muscle, and because of this and skin folds, which tend to hide it, fissure is sometimes difficult to locate until exposed through a slide speculum or author's anoscope.



Fig. 190.—Photograph of fissure in ano and sentinel pile—inflamed skin posterior to the rent.

When sphincter and levator ani muscles are hypertrophied and tightly contract, closing the anus, the rent may be located with a hook probe.

**Differential Diagnosis of Fissure in Ano.**—The manifestations of an appearance of fissure are characteristic, and it is difficult to understand how physicians frequently mistake it for the following affections:

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| 1. Ulcers.                           | 8. Sacrococcygeal neuralgia.       |
| 2. Sphincteralgia from other causes. | 9. Skin lesions.                   |
| 3. Hemorrhoids.                      | 10. Venereal ulcers.               |
| 4. Stricture.                        | 11. Pruritus ani.                  |
| 5. Cancer.                           | 12. Sciatica and lumbago.          |
| 6. Blind internal fistula.           | 13. Disease in neighboring organs. |
| 7. Abscess and fistula.              | 14. Cryptitis and papillitis.      |

**Ulcers.**—Various types of anorectal ulcers have been mistaken for fissure, but the chief points of difference between them have been incorporated in the accompanying table:

## DIFFERENTIAL DIAGNOSIS BETWEEN FISSURE IN ANO AND ULCER

	<i>Fissure.</i>	<i>Ulcer.</i>
Occurrence:	In middle-aged persons and infants.	In debilitated adults, rarely in children.
Onset:	Sudden during evacuation of hardened feces.	Gradual.
Location:	Posterior anal commissure.	Anal canal and rectum.
Pain:	Excruciating.	Slight.
Character of pain:	Sharp and tearing during defecation, dull and aching subsequently.	Heavy and burning.
Location of pain:	Anus during stool; sacrococcygeal region later.	Disseminated in rectum.
Sphincter:	Tonically or spasmodically contracted.	Normal or patulous.
Shape of lesion:	Long, narrow, slit-like.	Round and irregular.
Sensitive:	Very.	Slightly.
Hemorrhage:	Occasional and slight.	Frequent and profuse.
Stools:	Constipated.	Normal or loose.
Defecation:	Agonizing.	Slightly painful.
Discharge:	Feces streaked with blood.	Blood, mucus, and pus.
Edges of lesion:	Sharply defined.	Ragged or rounded.
Prognosis:	Good when uncomplicated.	Good when simple; grave when tubercular, syphilitic, or malignant.

*Sphincteralgia* from other causes—foreign bodies, cryptitis, papillitis, internal fistula, and unhealed wounds—is occasionally confused with fissure by ignorant and careless physicians, but not by proctologists, who systematically examine the anal region in all cases.

*Hemorrhoids* when strangulated or ulcerated cause considerable suffering and may be complicated by paroxysmal contraction of the sphincter, but there is no reason for mistaking them for fissure on account of their number, color, location and size, and absence of a racquet-shaped rent located at the posterior anal commissure and concealed by a skin-tab—sentinel pile.

*Stricture* in no way resembles painful ulcer, but has been mistaken for it, since either may be responsible for pipe-stem or tape-like stools.

*Cancer* supposedly is a painful disease, and because of this these patients often think they suffer from malignancy, but fissure causes greater suffering than cancer, except in late stages of the disease, when ulceration involves the skin or the tumor presses upon the sacral nerve.

*Abscess* has been mistaken for painful ulcer owing to accompanying pain, but it in no way simulates fissure, since abscess pain is continuous, throbbing, and not greatly aggravated by defecation, and the patient complains of the usual manifestations of sepsis and a sensitive swelling forms near the anus or in the ischiorectal fossa.



*Fistula.*—Blind fistulæ (Fig. 191) are frequently diagnosed as fissures since they are in close proximity to the anus and may incite sphincteralgia, but patients thus afflicted give a history of an abscess and thick yellow discharge.

Fistula is further differentiated by small openings located posteriorly between the sphincters, which are easily detected with finger, probe, or inspection through the anoscope. Complete fistulæ have external and internal openings and are not likely to be mistaken for *painful ulcer*.



Fig. 191.—Fissure in ano and blind internal fistula: *a*, Fissure; *b*, sphincter crossing beneath it; *c*, excoriation of the perianal skin.

*Sacrococcygeal neuralgia*, encountered in depleted, nervous, anemic, or individuals having an abnormal coccyx, has been confused with fissure because of agonizing pain felt in the coccygeal region simulating that caused by sphincteralgia resulting from fissure.

*Skin lesions* (cracks) have been, but ought not to be, diagnosed as painful ulcer because they involve the anal integument, and the latter the mucosa at the posterior anal commissure.

*Venereal Ulcers*.—Chancres are single and recognized by their round, raised, non-sensitive oval border, while chancroids are multiple, long, located between anal skin folds, encroach upon the mucosa, have acutely inflamed, sharply defined edges, and induce sphincteralgia. The diagnosis is easily cleared by getting the patient's history and examining head, skin, and mouth for luetic stigmata, and closely inspecting the ulcers.

Congenital syphilitic lesions sometimes resemble fissures in form, but are usually larger and involve perianal skin of children who exhibit Hutchinson teeth and other stigmata.

*Pruritus ani* may be independent or caused by the discharge from a fissure. Feces or foreign bodies that lodge in a painful ulcer cause intense itching within the anus, but true *pruritus ani* differs from this type in that there is no rent, and distress is in the perianal skin, which is excoriated and thrown into radiating folds.

*Sciatica* and *lumbago* are characterized by pain located in the lumbosacral region and legs similar to that caused by fissure, which explains the occasional confusing of these conditions.

*Disease in neighboring organs* and fissure have been mistaken for each other because of accompanying reflex disturbances, but a systematic examination of the rectum and neighboring structures and organs enables one to quickly differentiate between them.

*Cryptitis* and *papillitis*, like fissures, incite sphincteralgia, but the former is differentiated by the cup-like crypts (Fig. 181), and the latter by the teat-like papillæ (Fig. 174) located at the mucocutaneous border.

#### TREATMENT

Patients suffering from painful ulcer frequently defer consulting a physician as long as possible because they hope to recover without medical aid or dread examination.

Spontaneous cure rarely takes place, and the old saying, "A stitch in time saves nine," is applicable here, for when fissure is treated early a cure is obtained by cleansing it, correcting errors in diet, regulating the stools, and making topical applications to the rent, but when neglected the lesion becomes chronic and difficult or impossible to heal without surgical aid owing to sphincteralgia.

When painful ulcer is associated with hemorrhoids, anorectal ulceration, enlarged papillæ, cryptitis, polyps, or internal fistula, etc., both affections require attention.

The treatment of fissure in ano is *prophylactic, non-operative*, and *surgical*, the latter being indicated in most cases because it

effects a cure in the shortest time with least discomfort to the patient.

**Prophylactic Treatment.**—Fissures are prevented by curing constipation, prescribing medicines to soften stools, healing neglected wounds and lesions of the anal canal, enlarging the anus or rectum when narrowed by congenital defects, cicatricial tissue, or muscular contraction, and curing any other disease that causes the retention and hardening of feces which lacerate the mucosa when expelled, or that is accompanied by a discharge which excoriates the anal mucosa or skin.

**Non-operative Treatment.**—Acute and semi-acute fissures are occasionally healed with aid of the therapeutic measures discussed below, but in the meantime the patient is to be treated symptomatically to relieve pain, overcome insomnia, and procure satisfactory stools.

The *palliative* and *non-surgical* treatment of fissure in ano consists chiefly in (a) regulating stools, (b) restricting the diet, (c) relieving pain and sphincteralgia, (d) making topical applications, (e) treating erosions of the skin and mucosa, and (f) having the patient rest in bed during attacks of sphincteralgia.

*Regulation of stools* is most important, and a saline laxative or dinner pill is prescribed nightly to procure one or more semi-solid daily evacuations; this is necessary because fissure patients delay going to stool owing to fear of pain during and following defecation, and as a result allow feces to collect in the rectum which become hard, nodular, and traumatize the lesion when evacuated, causing at first tearing, and later continuous, heavy, excruciating pain.

Drugs are unsatisfactory when they lead to hard or fluid movements which augment suffering, the former through stretching the fissure and inducing sphincteralgia, and the latter by causing stinging pain and tenesmus.

In this class of cases satisfactory daily evacuations are usually obtained with minimum discomfort by the administration of liberal doses of olive, cotton-seed, or mineral oil, or copious castile soap, flaxseed, or glycerin enemata, which soften feces and facilitate defecation.

Injections must be cautiously given, for the author has treated several patients where fissures were aggravated, enlarged, and unnecessary pain caused by careless introduction or employment of broken, ragged pointed, rough, or unlubricated syringe nozzles.

Occasionally the author has mitigated suffering incident to defecation by having the patient drink abundantly of water and

empty the bowel twice daily, which favors soft and smaller movements.

Experimentation with different laxatives may be necessary before one is found that meets indications. *Castor oil*, ℥ss to ℥j (15–30 c.c.), is effective where feces are impacted and the abdomen distended with gas. *Cascara sagrada*, fluidextract, ℥xx (1.3 c.c.), cordial, ℥j (4 c.c.), or cascara pills, gr. v (0.3), administered once or twice daily is reliable in the majority of cases, but when unsatisfactory, *pulvis glycyrrhizæ composita*, ℥j (4 c.c.), taken at night usually procures comfortable evacuations. *Saline mineral waters*, *magnesium*, and *sodii sulphas*, or *potassii et sodii tartras*, ℥ij (8 c.c.), soften or liquefy movements, but when they induce cramps or numerous evacuations are prescribed more frequently in smaller doses.

Usually desirable stools are obtained by prescribing two of the dinner pills given below:

R. Fel bovis purif .....	gr. j	0 06;
Ext. colocynthis .....	gr. $\frac{1}{4}$	0 016;
Ext. hyoscyami .....	gr. $\frac{1}{4}$	0 016;
Ext. nucis vomicæ .....	gr. $\frac{1}{4}$	0 016.

Misce et fiat pil. j.

Sig.—One at bedtime.

R. Resinæ podophylli .....	gr. v	0 3;
Ext. physostigmatis } .....	āā gr. viiss	0 5.
Ext. nucis vomicæ }		

Misce et fiat cum ext. et pulv. q. s. in pilulæ xxx.

Sig.—One pill night and morning.

R. Ext. rhamni purshianæ .....	℥ss	2 0;
Ext. nucis vomicæ .....	gr. iv	0 26;
Ext. physostigmatis .....	gr. iij	0 3;
Ext. belladonnæ .....	gr. ij	0 12.

Misce et fiat massa div. in pilulæ xx.

Sig.—One pill at night or twice daily.

R. Aloinum .....	gr. iij	0 2;
Strychninæ sulphas .....	gr. $\frac{1}{2}$	0 02;
Ext. belladonnæ .....	gr. ij	0 12.

Misce et fiat massa div. in pilulæ xx.

Sig.—Take one pill at bedtime.

Flatulence can be relieved or prevented with the accompanying prescription:

R. Fl. ext. sennæ } .....	āā ℥vj	24 0;
Syrupus zingiberis }		
Tincturæ jalapæ .....	℥ss	16 0;
Tincturæ nucis vomicæ .....	℥xl	2 6.—M.

Sig.—A tablespoonful in a wineglass of sugar-water as required.

Occasionally *oleum olivæ*, *oleum gossypii seminis*, or *Russian petrolatum liquidum*, ℥ss to ℥j (15–30 c.c.), taken night and morn-



ing, add greatly to the patient's comfort by lubricating the bowel and softening feces, which are evacuated without causing pain or traumatizing the fissure.

Fruit, helpful in constipation, is undesirable in this class of cases because seeds sometimes lodge in the fissure and cause itching or pain, but *Les Fruit* accomplishes desired results.

Impaction is a frequent complication of painful ulcer, and when large fecal masses are not evacuated through the administration of castor oil, soapsuds, glycerin, or oil enemata, they are broken up with the finger and washed out through a proctoscope following anesthetization of the fissure.

*Restricting the diet* is essential where stools are firm and nodular; the author permits a regular diet as long as comfortable daily movements prevail, but when independent of laxatives feces repeatedly collect, forming scybalæ or large firm masses, peas, beans, celery, and vegetables rich in cellulose are prohibited because they leave a large coarse residue, and the diet is confined to fruit, milk, soup, eggs, beef extract, etc., until the rent is healed or feces become soft and fail to traumatize the lesion.

*Treatment of Pain and Sphincteralgia.*—These manifestations are often prevented or relieved by cleansing the fissure, prescribing a soft diet, and keeping evacuations mushy or semisolid, after the plan outlined, but in aggravated cases, where the ulcer is sensitive and the sphincter and levator ani muscles irritable, additional measures are required to forestall, modify, or prevent pain and muscular spasms.

Post-defecatory suffering is minimized or arrested by taking a sitz-bath, applying of fomentations, hot-water bag, or an electric pad over anus and sacrococcygeal region, reinforced by warm oleum olivæ or cotton-seed oil enema, ℥iij (90 c.c.), but when these agents fail, medicated lotions, suppositories, ointments, or hypodermic injections of morphin, gr.  $\frac{1}{4}$  (0.016), are required to control sphincteralgia and pain.

In aggravated cases the author relieves discomfort by placing a cotton pledget saturated with cocain (10 per cent.) in the rent or injecting a few drops of eucain ( $\frac{1}{8}$  per cent.) beneath the fissure to



Fig. 192.—Ointment applicator, useful in the treatment of piles, ulcers, fissure, sphincteralgia, and inflamed crypts.

prevent or alleviate severe pain and sphincter-algia caused by defecation, topical applications, or examination.

Powdered eucain, orthoform, and analgin diminish suffering when dusted over the ulcer, but do not entirely eliminate pain incident to defecation. Enemata of starch-water and laudanum have been employed to relieve discomfort, but morphin hypodermically, gr.  $\frac{1}{4}$  (0.016), or in suppositories is preferable.

When pain and sphincteric irritability are moderate the following ointments, used through a hard-rubber pile-pipe (Fig. 192), collapsible tube having a long nozzle (Fig. 180), or ointment syringe, add greatly to the patient's comfort:

R̄.	Hydrargyri chloridi mitis.....	gr. vj	0 4;
	Ext. belladonnæ.....	gr. viij	0 53;
	Ext. opii.....	gr. vj	0 4;
	Petrolati.....	ʒj	30 0.

Misce et fiat unguent.

Sig.—Apply morning and night, using a pile-pipe or collapsible ointment tube.

R̄.	Morphinæ sulphas.....	gr. viij	0 53;
	Cocainæ hydrochloridum.....	gr. xij	0 8;
	Hydrargyri chloridum mite.....	gr. xij	0 8;
	Petrolati.....	ʒj	30 0.
	Adeps lanæ hydrosus.....		

Misce et fiat unguent.

Sig.—Apply with an ointment syringe.

R̄.	Chlorotone.....	gr. iv	0 26;
	Thymolis iodidum.....	gr. xxxv	2 3;
	Ichthyol.....	gr. j	0 06;
	Petrolatum.....	q. s. ʒj	30 0.

Misce et fiat unguent.

Sig.—Use night and morning through pile-pipe.

Occasionally it is necessary to prescribe medinal, veronal, or trional, gr. x (0.6), to enable fissure patients to obtain needed rest and sleep.

*Topical Applications.*—Many surgeons uselessly cauterize *acute* and *chronic* fissures with nitric acid, stick silver, or other cauterants; a mistake, because they destroy surrounding tissue, induce agonizing pain, and incite sphincter-algia lasting for hours.

The above agents and strong solutions of silver, ichthyol, or iodine, 25 to 75 per cent., also do more harm than good, since they increase greatly irritation of the lesion and sphincter unless their application is preceded by anesthetization of the rent.

*Pain* and *sphincter-algia* from strong and weak topical applications is minimized or prevented by previously inserting a cotton pledget soaked in cocain 10 per cent. or injecting a few drops of eucain beneath the fissure.

*Acute* fissures are usually healed in from two to four weeks

by cleansing and swabbing them with silver nitrate, 6 per cent., ichthyol, 10 per cent., balsam of Peru, 20 per cent., or argyrol, 15 per cent., three times weekly, but silver and ichthyol solutions procure the best results. A combination of ichthyol, 15 per cent., chlorotone, 10 per cent., in flexible collodion when painted over the lesion relieves pain, protects the wound, and stimulates healing.

Chronic fissures are anesthetized and treated once with silver nitrate, 25 per cent., which forms silver albuminate that protects the ulcer, or ichthyol, 50 to 75 per cent., followed by the above-mentioned milder applications.

Usually painful ulcers are healed quicker when drained and stimulated daily by placing and leaving a small strip of medicated gauze in the rent. In obstinate cases plugging the fissure with a paste composed of ichthyol and bismuth subnitrate is curative and makes the patient comfortable. The application of hydrogen peroxid is contraindicated because it destroys new granulations and delays healing.

When the rectum is irritable or marked by ulcers, swabbing the mucosa with oil containing bismuth, aristol, or boric acid and cocain allays tenesmus and burning pain.

*Treatment of Erosions of the Skin and Mucosa.*—Erosions of the mucosa and perianal skin is prevented or healed by cleansing and drying the parts and daily applying one of the following dusting-powders or ointments:

℞.	Hydrargyri chloridum mite		
	Zinci stearas cum balsamum peruvianum	..... āā	℥ij 80;
	Sodii salicylas	..... ℥j	40.—M.
Sig.—Inflate the rectum and dust over the skin two or three times daily.			
℞.	Cocainæ hydrochloridum	..... gr. x	06;
	Hydrargyri chloridum mite	..... gr. xv	10;
	Zinci stearas	..... ℥j	300;
	Talcum powder	..... ℥j	300.—M.
Sig.—Apply in and outside the rectum as often as required.			

When the skin is inflamed, raw, painful, and itches the following prescription gives immediate relief and helps to heal erosions:

℞.	Ext. opii	..... ℥ss	20;
	Cocainæ hydrochloridum	..... gr. x	06;
	Menthol	..... gr. xx	13;
	Ungt. zinci oxidi	..... ℥j	300.—M.
Sig.—Apply to the excoriated skin two or three times daily.			

*Rest.*—Keeping the patient quietly in bed partially alleviates suffering, but is not curative.

*Electricity.*—The author has never succeeded in curing fissure with electricity, but in some instances pain and sphincteralgia were minimized with the sinusoidal high-frequency currents where the electrode was placed in the rectum.

*Mercurial ointments* are useful in the treatment of superficial fissures caused by chancroids or syphilitic lesions.

**Surgical Treatment.**—Fissure in ano is curable by operation in two or three weeks, a shorter time than is required to heal it by non-operative measures, which are often followed by recurrence because the anal canal is not widened and constipation is not relieved.

The surgical procedures described and recommended below are performed under infiltration anesthesia, devoid of danger, rarely complicated by hemorrhage, do not cause shock or confine the patient to bed more than three days, and effect a cure without leaving annoying sequelæ.

The author's deep incision operation (Figs. 197–199), in addition to curing painful ulcer, widens the anal canal, relieves painful defecation, and corrects constipation incident to a narrow anal canal or irritability of the levator ani or sphincter muscles.

One is justified in attempting a cure of superficial or deep painful ulcer by non-operative measures when the anus is not contracted, but surgical intervention is indicated when the sphincter is irritable and contracts, since sphincteralgia is responsible for intolerable postdefecatory pain and squeezes the fissure, preventing healing.

*General anesthesia* is never employed by the author in fissure operations except when the lesion is complicated by more serious rectal disease or the patient is nervous, frightened, and demands a general anesthetic. *Local* is preferable to general anesthesia owing to the patient's fear of losing consciousness, it is safer, heart, kidney, and lung complications are avoided, the patient walks to his room, is not nauseated, and can have something to eat immediately. The chief advantage of local anesthesia is that vomiting, straining, and tearing off of dressings by the semiconscious patient are avoided, which practically excludes danger from post-operative hemorrhage.

*Preparation*, as practised by the author, is simple, and consists in having the patient take a mild laxative the night before to insure a semisolid stool and enter the hospital half an hour before operation, when the nurse empties and cleanses the rectum by administering a small enema, and wiping the mucosa with a hydrogen peroxid solution, 25 per cent. The anal skin is washed



with green soap, followed by bichlorid, but is not shaved, since hair stubs subsequently cause much annoyance, and iodine is not applied, since it is painful, and the author does not fear infection, owing to the daily insertion of a drain.

The following are the operations most frequently performed in the treatment of fissure in ano, some of which are faulty and others reliable:

- |   |                       |
|---|-----------------------|
| 1. Division.                                      | 5. V-shaped incision. |
| 2. Partial division.                              | 6. Divulsion.         |
| 3. Splitting the anal canal and sphincter—Gant's. | 7. Excision.          |
| 4. Submucocutaneous myotomy.                      | 8. Cauterization.     |
|   | 9. Fulguration.       |

*Division.*—Painful fissure fails to heal in most instances because it is daily traumatized and squeezed by the irritable sphincter. On account of this an operation such as *divulsion* or *division* gives quickest and best results, because it puts the muscle temporarily or permanently at rest.

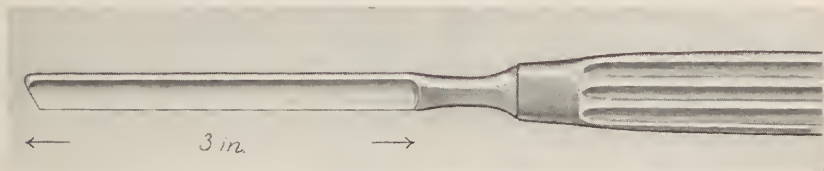


Fig. 193.—Author's blunt-pointed razor-blade anorectal knife employed in the division operation for fissure, splitting the anal canal and levator ani muscle to relieve rectal constipation, and incising the anal muscle for sphincteralgia.

Fissures are cured by severing the muscle through the rent or elsewhere, and subsequent treatment, but the former is preferable since an additional wound in the mucosa is unnecessary and delays convalescence.

Simple divulsion of the anal muscle (Fig. 194) and topical applications heal the rent, but subsequently do not prevent painful defecation, cure constipation, or act as a prophylaxis against recurrence of fissure where the patient has a narrow anal canal or hypertrophy of the levator ani or sphincter muscles.

*Technic* of the author's division operation is very simple: The fissure and sphincter muscle are anesthetized by introducing the needle posterior to the rent and injecting enough eucain into the rectal wall behind the lesion to blanch the tissues (Fig. 198), after which a straight blunt-pointed bistoury (Fig. 193) is guided into the lower rectum and then directed backward, when it is withdrawn through the fissure, severing the sphincter muscle (Fig.

194). In the absence of a suitable knife the muscle is severed with the author's scissors (Fig. 195) after the plan shown in the accompanying illustrations (Figs. 196, 197).

*Splitting the Anal Canal and Sphincter*—Author's Operation.  
—The author is convinced that this is the best operation, because

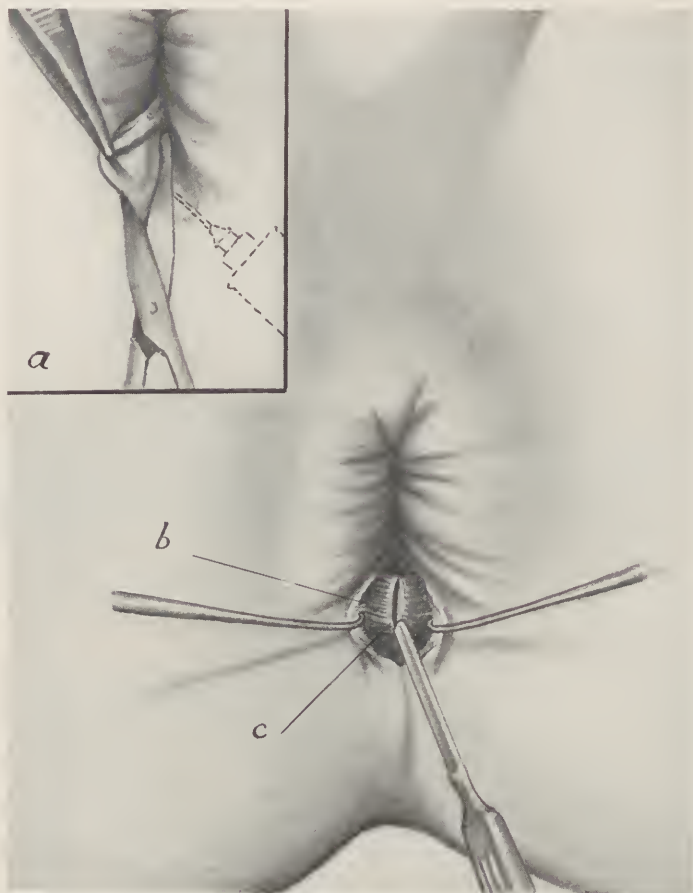


Fig. 194.—Author's local anesthesia operation for fissure where the sentinel pile is excised and the sphincter only is split: *a*, Removal of sentinel pile with scissors; *b*, appearance of wound left; *c*, dividing sphincter with the author's blunt razor-blade rectal knife.

with it he has cured over 1000 fissures without complications leaving sequelæ or recurrence except in 5 per cent. of cases in patients who suffered from constipation and fecal impaction from other causes.

The procedure in addition to curing painful ulcer relieves constipation and painful defecation, because it permanently widens

the anal canal so that semisolid and firm feces are easily evacuated without delay or discomfort which forestalls subsequent rents by preventing trauma at the anus by hardened feces that occurred prior to enlargement of the terminal rectum.

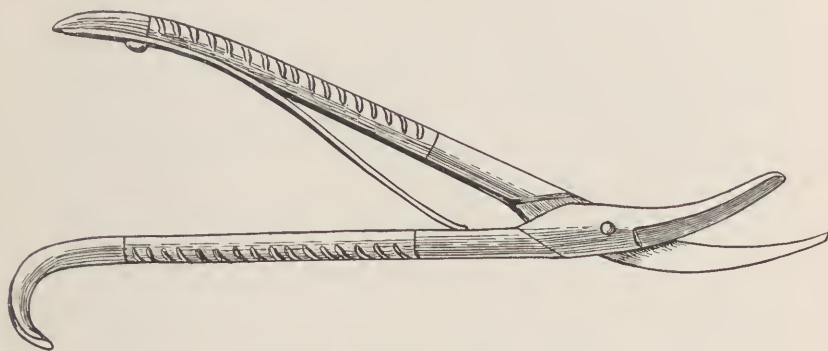


Fig. 195.—Author's fissure scissors.

The *technic* of splitting the anal canal is similar to division of the sphincter except the cut is longer and deeper. The sphincter, lower rectal wall, and tissues behind the fissure are slowly infiltrated upward along the posterior median line for a distance of 2 inches (5.68 cm.). Following exposure of the anesthetized white

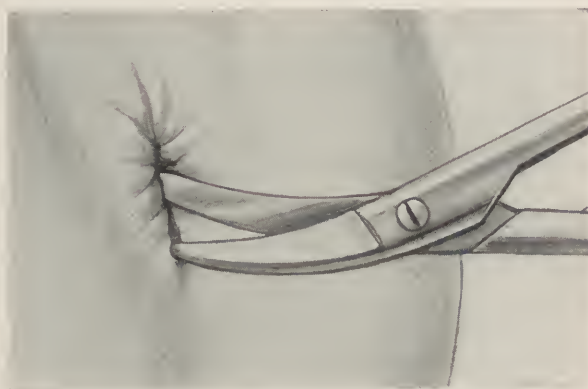


Fig. 196.—First step in author's scissors operation for fissure.

line (Fig. 198) with the author's speculum or anoscope, the anal canal is exposed and split posteriorly, including division of the sphincters, fibers of the levator ani muscle, and anal skin (Fig. 199) by a bold stroke made with the author's special blunt-pointed razor-blade bistoury (Fig. 193) carried well up into the rectum.

The operation is completed by inserting a gauze pack through the proctoscope with a rod (Fig. 200), withdrawing the procto-

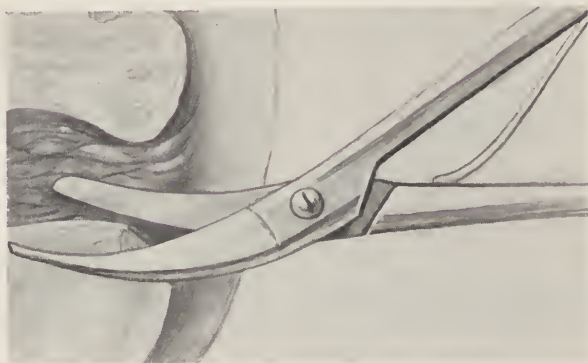


Fig. 197.—Second step in author's scissors operation for fissure.

scope, and snugly applying a T binder; subsequently the wound is cleansed daily, wiped dry and drained—not packed—with a



Fig. 198.—Technic of anesthetizing the muscle and anal canal when the sphincter is divulsed or incised for fissure in ano.

single narrow short strip of ichthyolized gauze. The author has never failed to cure fissure with this procedure, and fecal incontinence has not occurred in 1000 operations.



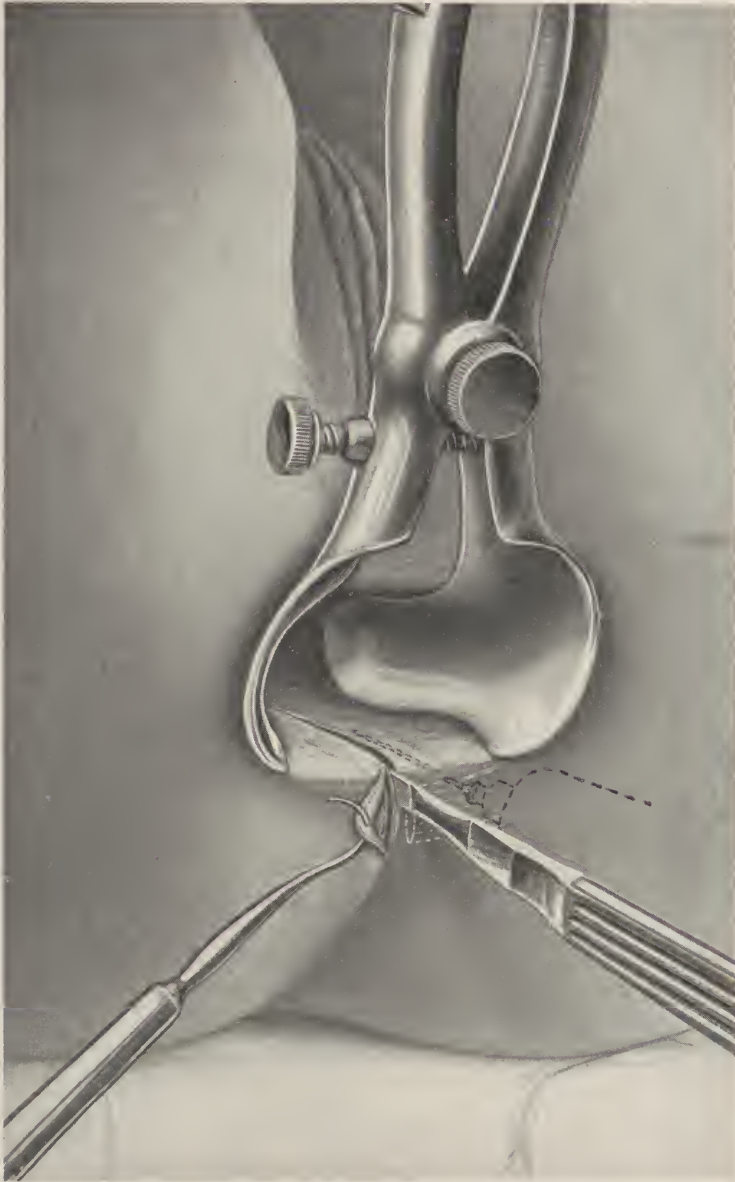


Fig. 199.—Author's radical local anesthesia operation which cures and prevents recurrence of fissure and permanently relieves constipation due to narrowing of the anal canal. Following eucainization of the lower rectal wall the sphincters and fibers of the levator ani muscle are divided by a 2-inch incision made with the author's special knife (Fig. 193).

Infection and diminutive or larger abscesses were observed 6 times due to careless dressing of the wound by interns in 4; leav-



Fig. 200.—Insertion of drain with aid of a metal rod in the author's radical operation for fissure and constipation.

ing the skin on a higher level in the lower than the upper end of the incision, so that a pocket formed in which feces collected in 1, and to feces burrowing under bridged tissue where the lower was permitted to close more quickly than the upper end of the wound in 1.

Suffering from constipation, painful defecation, trauma of the rent, sphincteralgia, frequent micturition, and prostatic irritability are immediately relieved by the operation, the patient quickly loses fear of an evacuation, and the wound promptly heals when treated as after fistulæ operations.

*Partial division* of the muscle practised by some surgeons is impracticable because sphincteralgia continues, the fissure heals

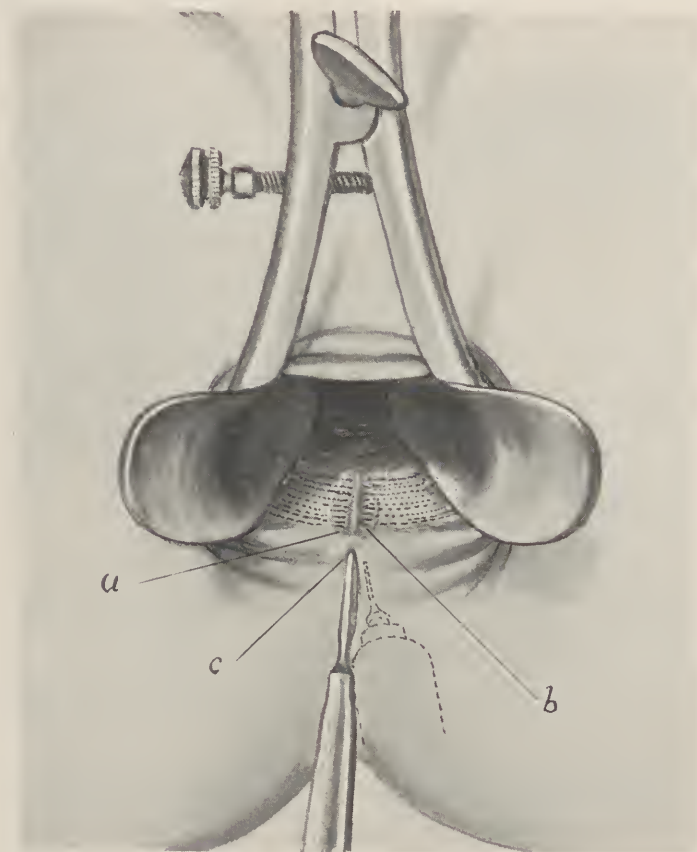


Fig. 201.—Author's local anesthesia submucocutaneous myotomy for sphincteralgia induced by fissure in ano: *a*, Fissure; *b*, knife severing the sphincter; *c*, point of entrance.

slowly or not at all because the rent is daily squeezed by the muscle which has not been entirely severed and put completely at rest.

*Submucocutaneous myotomy* is occasionally performed on patients who fear infection from a rectal incision. Following eucainization of the parts as in other fissure operations the sphincter is severed submucocutaneously in the posterior median line with a

narrow sharp-pointed bistoury and the wound drained with gauze (Fig. 201).

*V-shaped Incision.*—Good results are obtained from severing the anal muscle on both sides of the rent, which enables one to remove the sentinel pile within the V-shaped flap (Fig. 194, *A*).

The author has performed the operation many times, but does not believe it possesses any advantage over division of the sphincter directly through the fissure, and contends incontinence is more likely to follow this procedure because the muscle is cut diagonally at two points instead of straight across in the posterior median line.

*Divulsion—Dilatation.*—Divulsion of the sphincter is popular, but the author abandoned it years ago because (*a*) divulsion lacerates the mucosa, (*b*) traumatizes tissues, sometimes leading to the

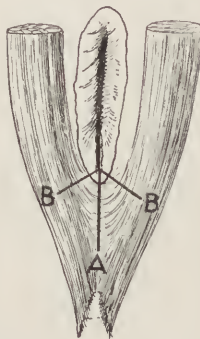


Fig. 202.—*A*, Median, and *B*, V-shaped incisions sometimes employed in putting the muscle at rest in fissure cases complicated by sphincteralgia and constipation.

formation of abscess and fistula, (*c*) occasionally induces proctitis, cryptitis, or papillitis, (*d*) is frequently accompanied or followed by sphincteric rupture and fecal incontinence, (*e*) the anal muscle frequently regains its power and sphincteralgia returns before fissure is healed, (*f*) constipation and painful defecation are not permanently relieved and the patient is not protected against recurrence of fissure, since the tight anal canal, a predisposing factor in painful ulcer, is not widened.

Forcible sphincteric divulsion (Fig. 79) should be made with fingers and not with specula or mechanical dilators, otherwise the anal muscles may be ruptured before one is aware of it, while with the fingers one quickly detects the giving way of the muscle-fibers, so that stretching can be stopped or pressure changed to another direction before the sphincter is seriously damaged.

The author has treated nearly as many patients for fecal



incontinence induced by sphincteric divulsion as from operations performed for abscess or fistula in ano. The sphincter may be gradually stretched with anal dilators (Fig. 203), Wale's bougies, author's inflatable bag, or fingers (Fig. 79). When the patient declines a cutting operation (division), forcible divulsion or gradual dilatation is sometimes justified.

Gradual divulsion consists in stretching the anus two or three times weekly with graduated dilators or fingers until the rectal outlet has been sufficiently enlarged and sphincteric spasms overcome.



Fig. 203.—Forcible divulsion of the sphincter with metal anal dilator following infiltration of the lower rectal wall with eucain (Fig. 198). The same instrument is employed to gradually dilate the anus following cocainizing the fissure.

Pain from divulsion is minimized by cocainizing the rent or injecting a few drops of eucain beneath it, but each treatment causes greater suffering than a curative operation.

*Forcible divulsion* (Fig. 203) is more effective than *gradual*, brings relief quicker, can be performed under *local* or *general* anesthesia in the office, home, or hospital, and the patient need not remain in bed more than two hours.

The author often stretches the rectal outlet by slowly inserting one after another until three fingers have been forced into the bowel (Fig. 101) following anesthetization of the sphincters and anal canal with eucain, accomplished by injecting the solution

posteriorly and then latterly along the anal canal without reintroducing the needle. This procedure is sometimes satisfactory, requiring about eight minutes; when the patient is placed under a general anesthetic the anal muscle is divulsed by introducing the index-fingers or thumbs well into the lower rectum, then slowly separating them first in one and then in another direction until they are  $1\frac{1}{2}$  inches (3.8 cm.) apart, or the anus remains patulous following their withdrawal.

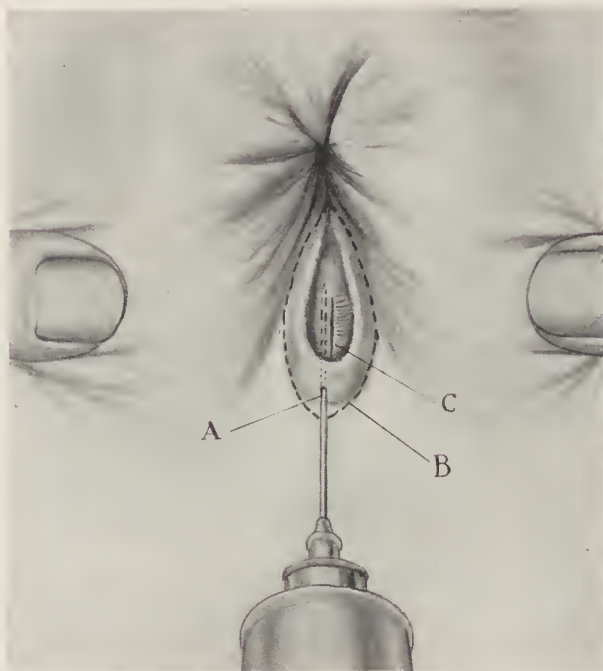


Fig. 204.—Author's operation for excising fissure in ano: A, Edges of and tissue beneath the rent being anesthetized; B, line of incision; C, sphincter split before wound is closed.

No harm follows *careful*, but serious injury to mucosa and sphincters is often caused by ignorant or *reckless*, stretching of the rectum. The sphincter muscles of women and children are weaker than in men and more likely to be lacerated by quick forcible divulsion unless the operation is carefully performed by an experienced surgeon. Dilatation of the sphincter is a reliable procedure and, next to division, is the operation of choice in the surgical treatment of fissure.

*Excision.*—Fissures are frequently excised by surgeons, but the procedure is seldom practised by experienced proctologists be-

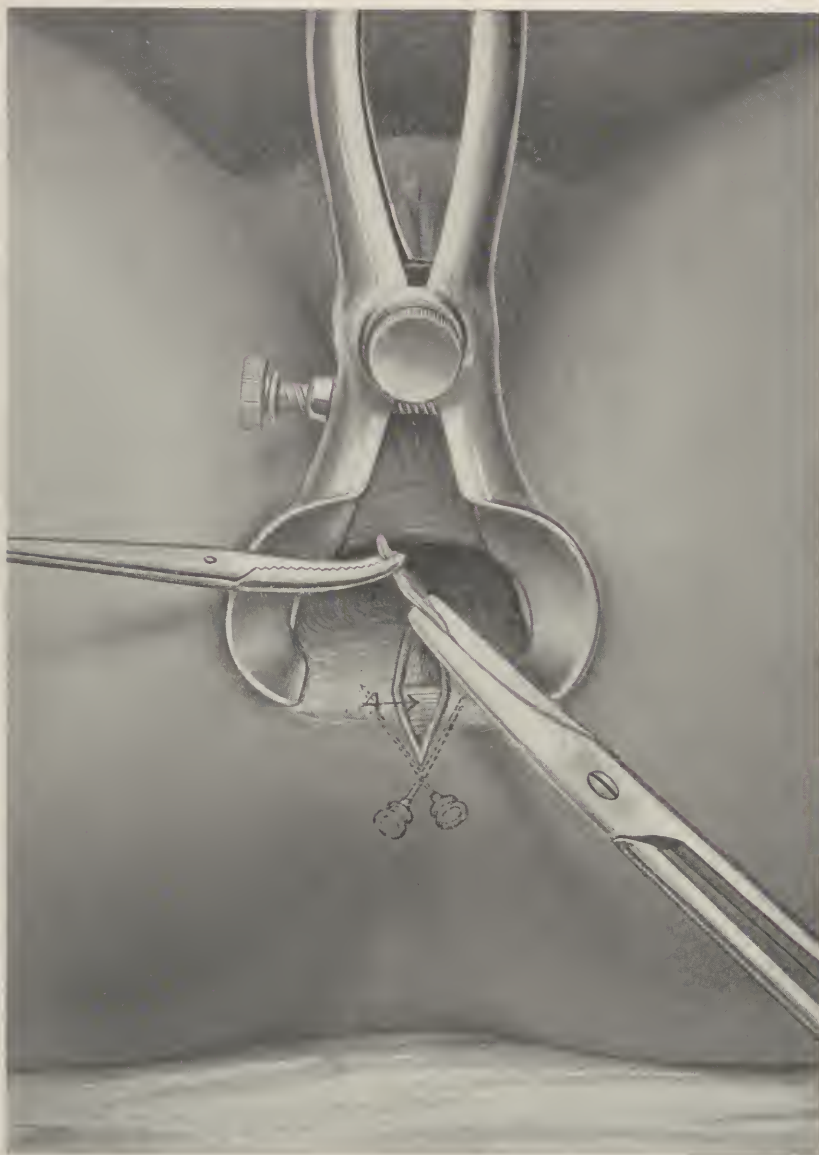


Fig. 205.—Excision of fissure without division of the sphincter, an unreliable procedure since the wound often fails to heal because of sphincteric activity and infection occurs unless a drain is inserted when mucocutaneous edges are sutured: A, Sphincter crossing the incision.

cause it requires considerable time, infection frequently occurs, and results are not so good as those following divulsion or incision of the sphincter and insertion of a drain.

The operation consists in seizing the fissure with forceps and trimming off edges, closing the wound with interrupted catgut



Fig. 206.—Wound closed and drained in author's local anesthesia excision operation for fissure in ano, where the sphincter has been divided.

sutures, and introducing a small drain (Fig. 206). This procedure is objectionable because it does not sever and put the sphincter at



rest or widen the anal canal, which are essential to a cure, relieve constipation, and prevent recurrence.

The author never excises fissure except when requested to do so by the patient or his physician, and then only when he is permitted to *incise* the sphincter (Fig. 194) before fissure is freshened and approximated, a procedure that prevents subsequent sphincter-algia and drawing of wound edges apart by muscular contractions.

Excision is occasionally complicated by abscess or fistula and does not possess any advantages over the division or divulsion procedures. Some surgeons perform the operation, believing it necessary to remove indurated and scar tissue about the lesion, but the author has never failed to cure a fissure by putting the muscle at rest, whether or not it was encircled by cicatricial tissue.

*Cauterization.*—Chronic fissures are occasionally cured by cauterizing them with a Paquelin or electric cautery following eucaïnization, but better results are obtained when the cautery point is carried through the sphincter. *Fulguration* of the lesion is as effective as cauterization and not nearly so painful.

Division and divulsion are preferable to cauterization and fulguration because they give better results, subsequent pain is less, and burning is sometimes followed by sloughing or formation of cicatricial tissues that narrows the anus or enlarges the sphincter.

Multiple fissures usually heal following division of the sphincter at one point. When fissure wounds get sluggish they are swabbed with ichthyol, 15 per cent., before the drain is inserted.

## Chapter XVI

### Catarrhal and Infectious Proctitis—Rectitis<sup>1</sup>

PROCTITIS is seldom recognized by physician or surgeon, and because of this its importance is not appreciated except by the proctologist, who understands the frequency of and far-reaching local and general effects of the condition (See Plates II and III).

Rectitis may be primary or secondary to other bowel affections, disturbances in neighboring organs, or systemic disease, and end-results of proctitis may be encountered in adjacent structures or distant parts.

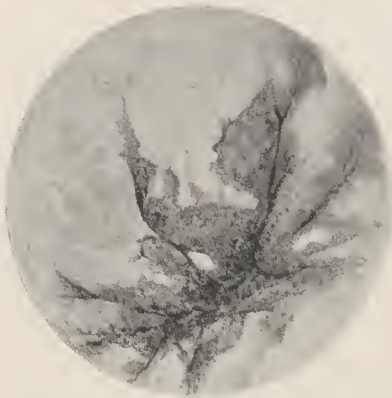


Fig. 207.—Proctoscopic view of chronic catarrhal ulcerative proctitis.

The inflammatory process may attack one side, the entire lower bowel, or be limited to a small or considerable area in the rectum, be confined to the mucosa, or involve one or all of the deeper tunics, and occasionally the perirectal structures—periproctitis. Generally inflammation is not restricted to the rectum, but continues upward to the sigmoid flexure—*sigmoiditis*—or colon—*colitis*—and when

the disease is limited to the terminal bowel the line of demarcation is not always easy to define.

Rectitis recognized by the proctologist was rarely detected until the advent of the *proctosigmoidoscope* and technic of *rectal inflation* had been perfected, because it cannot be recognized by the finger or diagnosed through a speculum which exposes only a small area of the anal canal mucosa.

The condition may exist without the patient's knowing it, induce slight annoyance, cause distressing manifestations, or lead to serious lesions—*extensive ulceration*, *abscesses*, *fistulæ*, *stricture*, *perforation*, etc.—that partially or totally incapacitate the patient for social and business duties or terminate fatally.

<sup>1</sup> See Vols. I and II for a full discussion of catarrhal, amebic, tubercular, bacillary, balantidic, helminthic, and gonorrheal colitis.

PLATE II



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1. Proctoscopic view of atrophic proctitis; note flakes of feces adherent to mucosa.
2. Proctoscopic view of granular hypertrophic proctitis marked by hemorrhagic areas and erosions.
3. Proctoscopic view of swollen mucosa in early stage of gonorrheal proctitis.
4. Sigmoidoscopic view of chronic catarrhal granular and ulcerated proctocolitis.
5. Sigmoidoscopic view of chronic hypertrophic proctocolitis complicated by papillomata and polyps.
6. Sigmoidoscopic view of catarrhal follicular enterocolitis, showing granulated areas, ulcers, and erosions of the mucosa.





Proctitis is met with in all countries, races, climates, at different altitudes, in both sexes, and at all ages, but is encountered more frequently in men than women, adults between twenty and forty, bottle-fed children, and in persons whose occupations are arduous, exposes them to inclement weather or compels them to work in overheated buildings, such as brass and steel foundries, or live in southern states, semitropical or tropical countries where amebic, bacillary, helminthic, and other types of *infectious* coloproctitis—dysentery—are prevalent.

*Catarrhal proctitis* (Fig. 207) is very common in New York, lake districts, and near ocean resorts—where nearly everyone suffers from catarrh of the nose, throat, ear, stomach, intestine, or rectum—and is less common in mountain or inland communities located more than twenty miles from large bodies of water where there is little moisture in the air.

There are many types of rectitis, but the author will discuss them under the following headings:

1. Catarrhal proctitis.
2. Infectious specific proctitis.

#### CATARRHAL PROCTITIS—RECTITIS

This condition is particularly common in the United States, especially New York City, while infectious proctitis is more frequently encountered in the tropics.

Catarrhal rectitis may be *acute* or *chronic*, but the majority of patients coming to the proctologist suffer from the latter, since the family physician usually takes care of the former or the patient treats himself with home remedies.

**Acute Catarrhal Proctitis.**—In the young, acute proctitis usually attacks artificially fed children, is a complication of whooping-cough, scarlet fever, diphtheria, chickenpox, and grip, or caused by cathartics, scybalæ, or irritant medicines. In adults acute catarrhal rectitis is generally induced by purgation, dietary indiscretions, exposure, extreme heat, contaminated water, ptomain poison, chemical irritants—mercury, arsenic, etc.—medicated injections, worms, constipation with fecal impaction, excessive fermentation or putrefaction, or careless introduction of instruments or imperfect enema tubes.

In this condition the mucous membrane is congested, sensitive, swollen, and may be edematous over a circumscribed area or throughout the rectum, and has a bright or dark red color. The inflammatory process seldom extends to deeper rectal tunics, and the

bowel, which is dry and hot in the beginning, subsequently is smeared with mucus or a mucopurulent discharge that may incite tenesmus and sphincteralgia or cause excoriation of the mucosa or perianal skin. When complicated by marked swelling or edema the anal canal is clogged, and straining incident to evacuations occasionally causes eversion of the mucosa or internal hemorrhoids.

In rare instances a diphtheric-like membrane forms, undergoes necrosis, and sloughs away over diminutive or larger areas. In aggravated cases hypersecretion of mucus is marked, there is slight bleeding, and pus appears in the stools, under which circumstances erosions are well defined and superficial ulcers are observed.

**Symptoms.**—Acute rectitis is of sudden onset, and the patient complains of malaise, headache, loss of weight, heat, fulness, and burning pain in the rectum, tenesmus, frequent or constant desire for an evacuation unrelieved by defecation, mild diarrhea, and slight or copious evacuations of blood-tinted mucus, frequent micturition, painful contraction of the levator ani and sphincter muscles, and marked discomfort or excruciating pain caused by introduction of the finger, proctoscope, or enema tube, and evacuation of hardened feces.

**Diagnosis.**—This condition is readily recognized by manifestations reinforced by digital examination and inspection of the rectum through the proctoscope (Fig. 208).

*Acute catarrhal* is frequently mistaken for infectious proctitis induced by gonococci, tubercle bacilli, *Entamoeba histolytica*, Shiga bacilli, and other infectious agents, but the latter is easily differentiated from catarrhal inflammation by examining fresh stools and finding *pathogenic organisms* causing the disturbance.

**Treatment.**—Acute catarrhal proctitis may disappear spontaneously, but treatment is essential in most cases. This class of patients recover more quickly when put to bed, restricted to a diet composed of soups, broths, gruel, soft-boiled eggs or scraped meat, and the rectum is cleared of food remnants, hardened feces, mucus, and irritating discharges by normal saline or boric acid irrigation, or an enemata following a dose of mineral water or sulphate of magnesia or soda. The rectum is cleansed twice daily with an antiseptic or astringent irrigant, the strength of which is increased when erosions or ulcers are numerous or large: silver nitrate, 1 : 3000; thymol, 2; potassium permanganate, 1; boric acid, 5; carbolic acid,  $\frac{1}{2}$ ; hydrastis—non-alcoholic, 1; argyrol, 6, or ichthyol, 2 per cent., using the author's or other return flow irrigator.

Some patients derive comfort from cold, while others prefer hot solutions; irrigations are preferable to enemata because the latter induce more or less distention pain.

Owing to hypersensitiveness of the mucosa and sphincteric irritability the author projects a small quantity of eucain, 2 per cent., into the anal canal with a piston syringe preceding introduction of the anoscope or proctoscope, through which lesions and ulcers are treated with silver nitrate or ichthyol, 6 per cent., or the rectum is swabbed with methylene-blue, 10 per cent., which is soothing and healing.

Sprays similar to those used by laryngologists for catarrhal throat trouble are helpful, but more satisfactory results are obtained through insufflation of the rectum with one of the accompanying dry powders, which minimize discomfort, lessen bleeding, and favor healing of lesions.

R.	Morphin sulphate.....	gr. vj	04;
	Cocain hydrochlorate.....	gr. xij	08;
	Hydrag. chlor. mit.....	℥ss	20;
	Zinc stearate	āā ℥ss	160.—M.
	Pulv. talcum		

Sig.—Insufflate rectum and sigmoid flexure daily or three times weekly.

Morphin and cocain are omitted when the mucosa is not hypersensitive. When erosions and ulcers are numerous and a stronger powder is required the following prescription will serve the purpose:

R.	Tannic acid.....	℥ss	20;
	Bismuth salicylate.....	gr. xx	13;
	Pulv. alum.....	℥ss	20;
	Pulv. talcum.....	q. s. ad. ℥j	300.—M.

Sig.—Insufflate the bowel through a proctoscope every other day.

Analgin, orthoform, and xeroform employed alone or in the following combination are soothing and healing in this class of cases.

R.	Nosophen	} .....	āā ℥ij	80.—M.
	Dermatol			
	Orthoform			

Sig.—To be insufflated in small quantities as often as required.

Sometimes better results are obtained by alternating insufflating with irrigating or topical treatments. An emulsion composed of olive oil, ℥iij (90.0), and bismuth subnitrate, ℥iss (6.0), allays tenesmus, pain, and sphincteralgia when injected nightly as hot as can be borne, because it soothes the hypersensitive mucosa and protects lesions against irritating feces and discharges.

Pain is satisfactorily relieved by the introduction of suppositories containing morphin or cocain, gr.  $\frac{1}{6}$  (0.01), belladonna extract, gr.  $\frac{1}{4}$  (0.016), and ichthyol, gr. j (0.06), according to indications. Discomfort from erosions in and about the anus caused by evacuations or mucus seeping through the anus is lessened by silver nitrate (6 per cent.) applications and smearing the parts with zinc oxid ointment.

The internal administration of antiseptic and antifermentative remedies have not benefited the author's cases.

*Surgical interference* is unnecessary in the treatment of acute catarrhal proctitis except when complicated by abscess or fistula, which is incised and drained, or protrusion of the mucosa or internal hemorrhoids, either of which may be speedily and painlessly removed by the *ligature* method following their infiltration with a  $\frac{1}{8}$  of 1 per cent. eucain solution.

**Chronic Catarrhal Proctitis—Rectitis** (Fig. 208).—This is one of the most common anorectal diseases with which the author has had to contend, and he knows of no other affection occurring in this region more difficult to cure or that more frequently leads to local complications or systemic disease. Rectal catarrh may be *primary*, but is probably more often *secondary* to disease located higher up in the intestine, neighboring organs, or structures distant to the bowel—neurogenic, gastrogenic, and enterogenic disturbances, heart and circulatory affections, obstruction of the liver ducts, portal system, pancreas or intestines, chronic coprostasis, influenza and infectious diseases of childhood, ailments accompanied by diarrhea, hypersecretion of mucus, excretion of toxins, irritating discharges or *focal infection* from lesions located in the head, mouth, throat, lungs, stomach, liver, upper small intestine, colon or rectum, abdomen, female genitalia—genito-urinary tract—or perirectal structures into which pathogenic micro-organisms find their way via the blood, lymphatics, fistulæ, or by being discharged from above into the lower bowel through the ring-like opening at the rectosigmoidal juncture.

**Etiology.**—This condition is probably an infection, but specific bacteria solely responsible for it have not yet been discovered. Causative factors in chronic catarrhal proctitis are numerous, varied, and may be *local* or *systemic* and *intra-* or *extra-intestinal*. Some individuals inherit a weakened constitution which renders them susceptible to the disease, and our present manner of living is evidently conducive to rectal catarrh, for the disease is encountered more frequently than formerly, but this is partially accounted for by improved diagnostic technic. A full discussion of the numerous



factors concerned in the production of proctitis is impracticable in a work of this scope, hence the author will be content with naming frequent and discussing only the more important causes.

Briefly summarized the following are the chief *primary* and *secondary* etiologic factors in catarrhal proctitis: *Living in moist or unhygienic communities, arduous occupations, working in superheated buildings—steel mills, etc.—exposure, extreme heat, sitting on damp or cold steps, dietary indiscretions—gourmandizing, eating too often, fast, at irregular hours, or food that is very hot, cold, improperly cooked, or contaminated—sudden changes of climate or altitude, violent exercise, daily purgation—with saline, jalap, podophyllin, etc.—taking of medicines that irritate the intestinal mucosa—mercury—constipation and fecal impaction, mechanical irritants—worms, gall-stones, foreign bodies, parched corn, seeds, etc.—pederasty, rectal massage—for enlarged prostate—careless introduction of instruments, proctoscopes, or enema tubes, suppositories—containing medicines that irritate the mucosa—helminths—tape, lumbricoid, and thread-worms, soap—alkali—and medicated injections and irrigations.*

Catarrhal proctitis is frequently associated with or caused by *psychic* and *neurogenic disturbances*, unbalanced *gastric* and *enteric secretions*, *hepatic* and *pancreatic abnormalities*, *catarrhal* and *infectious enterocolitis*, *obstructions to the portal system*, *appendicitis*, *focal infection in the head, lungs, or gastro-intestinal tract*, or any other *local* or *systemic* disease complicated by frequent watery evacuations, fermentation, putrefaction, irritating mucous discharge, or fecal impaction, any of which may incite rectal catarrh through traumatizing, irritating, or infecting the rectal mucosa.

*Chronic intestinal obstruction—cancer, stricture, polyps, ptosis, angulation, volvulus, invagination, kinks, diverticulitis, extra-intestinal pressure, etc.—with stasis induce rectitis by retaining feces until hard and favoring the multiplication of pathogenic organisms and their toxins, which tend to set up an inflammation when reaching the rectum.*

Occasionally catarrhal proctitis is secondary to *tumors* and *inflammatory processes* or *malignancy* involving *abdominal, pelvic, or genito-urinary organs*. Not infrequently catarrhal inflammation is induced by *anorectal disease, ulcers, fistula, abscess, hemorrhoids*, or other *lesions* responsible for congestion of the parts or discharge that irritates the mucosa.

In a few instances the author has known contractions of the *levator ani* and *sphincter muscles* to cause or prolong catarrhal proctitis involving the anal canal through persistently squeezing the

lower rectum, and has treated a few cases of obstinate rectitis induced by myriads of squirming thread-worms.

**Pathology.**—Structural changes observed in chronic catarrhal proctitis vary considerably in different cases, depending on whether the disease is primary or secondary, its duration, part played by mixed infection, and complications of rectal or systemic disease.

Chronic rectitis when typical is encountered in one of two forms—*atrophic* (Fig. 207) or *hypertrophic* (Fig. 208), the former being nearly always primary, while the latter is secondary to acute rectitis, which, in turn, is often caused by inflammatory disease higher up. The atrophic is said to be more common than the hypertrophic type, but the author has encountered the latter very much more frequently than the former. Hypertrophic is usually continuous with catarrhal inflammation involving other segments of the large intestine, while atrophic rectitis is confined to the rectum and anal region.

*Atrophic Catarrhal.*—Here the inflammation begins early in life, is chronic from the beginning, encountered most frequently in women, confined to the rectum, seldom involves the submucosa, muscular tunic, or peritoneum, seldom causes proctitis or systemic disease, is rarely complicated by diarrhea and troublesome tenesmus or profuse bleeding—not being associated with colitis—and is characterized by atrophy of the anorectal mucous membrane, glands, and perianal integument.

In these cases the mucous membrane is thin, dry, inelastic, cracks easily when scratched, not highly congested, of a dusky red color, is glistening, and may have a smooth, uneven or roughened fissured surface dotted here and there by adherent flakes of inspissated fecal matter resembling bits of smoking tobacco (Plate II, 1), and secretes little mucus. Mucosa of the anal canal and skin of the perianal region is parchment-like, fissured, breaks on introduction of the proctoscope or finger and when stretched during defecation by feces; slight trauma causes diminutive wounds through which blood oozes, which in a measure accounts for the formation of so-called pin-point ulcers observed in this condition.

Occasionally granulations, medium-sized ulcers, and hyperemia of the mucosa limited to small or large areas are observed, and in such cases the submucosa is thickened and dense, but polyps are seldom if ever present. Follicles of Lieberkühn, goblet cells, and intertubular tissue undergo atrophic changes, which accounts for the hypersecretion of mucus.

*Hypertrophic Proctitis.*—This type (Fig. 208) of catarrhal rectitis is often a continuation of inflammatory processes involv-

ing the colon or sigmoid flexure, but may be limited to the rectum or attack one or more definite areas in the lower bowel. In this



Fig. 208.—Proctoscopic view of chronic proliferating hypertrophic proctitis.

affection the mucous membrane is highly congested—intersecting vessels being prominent—has a deep red color, is considerably

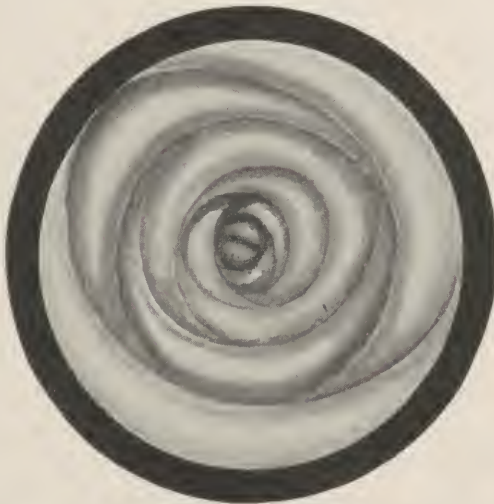


Fig. 209.—Proctoscopic view of hypertrophic proctitis. Note swollen edematous ridges of mucosa.

swollen, edematous, and may be immobile or lax and extrude through the sphincter during straining (Fig. 209).

In obstinate cases all rectal tunics are considerably thickened and sometimes indurated, follicles of Lieberkühn enlarge, interglandular spaces widen, mucus-secreting cells multiply, and connective tissue accumulates in the submucosa, which in rare instances causes rectal rigidity or stenosis. In some cases tubular glands are very long, irregular in shape, and form cysts when their inlets are closed. In neglected cases the mucosa is less congested, sensitive, and pliable, epithelium is displaced over diminutive or larger areas, and the bowel surface is marked by erosions, pin-point or larger ulcers, and papillaomata or polyps, variable in size and shape.

The mucous membrane, which in the beginning was smeared with clear or blood-tinted mucus, is later partially or completely covered with mucus in the form of strings, strips, or jelly-like accumulations—often resting above the rectal valves—but when there is active mixed infection and the bowel is extensively involved by erosions and ulcers or discharge the mucous membrane is bathed with an offensive, whitish, irritating, mucopurulent discharge that seeps through the anus and inflames adjacent skin.

Physicians and proctologists who expect to find typical cases of *atrophic* and *hypertrophic* catarrhal proctitis will often be disappointed, since changes at different times make their differentiation confusing, and in aggravated neglected cases, owing to the part played by mixed infection, trauma induced by feces and straining, irritant action of the discharge, and contraction of the anorectal muscles; symptoms and appearance of the rectum are not always characteristic of either atrophic or hypertrophic catarrh.

Chronic catarrhal proctitis with or without extensive infection is responsible for many local perirectal and systemic diseases. In deplorable cases in addition to the inflamed thickened, sensitive, excoriated, or ulcerated mucosa the patient may suffer from periproctitis, multiple superficial fissures, submucous, subcutaneous, ischiorectal or perirectal abscess and fistula, hypertrophied rectal valves, stricture, procidentia recti, congested protruding hemorrhoids, papillomata and adenomata—variable in size and length—enlarged anal papillæ, hypertrophied levator ani and sphincter muscles or relaxation of the latter, cryptitis, excoriation of the perianal skin, pruritus ani, localized peritonitis, perirectal adhesions, frequent micturition, congestion of the prostate, cystitis, or irritation of the labia and perianal skin.

*Strictures, partial or complete*, and of the *annular or tubular* variety is one of the most frequent and serious complications of chronic catarrhal rectitis, and several times the author has studied



them from their incipency where there was slight ring-like thickening of the mucosa and submucosa until they were fully developed and occluded the bowel, which occurred most frequently at the site of *rectal valves* except when the stenosis was of the tubular variety and involved different segments or the entire rectum.

The author believes *catarrhal proctitis and associated mixed infection is responsible for more rectal strictures than all other varieties of proctitis, including luetic, tubercular, amebic, bacillary, and other infectious types*. Older writers thought that 50 per cent. of rectal strictures were syphilitic, and the majority of the remainder were caused by tuberculosis, but accidental injuries and surgical operations, usually Whitehead's, have caused stricture more frequently than lues or tuberculosis in the author's cases.

Chronic hypertrophic, like other forms of proctitis complicated by ulceration, is frequently responsible for *rectal focal infection*, which, in turn, causes *local disturbances* or *systemic disease*—rheumatic fever, endocarditis, cholecystitis, gastric and duodenal ulcer, nephritis, neuralgia, cystitis, pneumonia, and proctitis (see Focal Infection).

*Mucous Channels*.—Jameson originally and Albright later claimed that mucous pouches and channels are frequently complications of proctitis (Figs. 281, 282). "When tissue is tense and furnishes too much resistance to the mucus, so that sacs do not form, it will burrow in the direction of least resistance and form channels which extend in various directions and to a considerable length. Under these circumstances the most common course taken by mucus is along the connective tissue between the mucous and muscular layers of the rectum, thence downward toward the anus; as this stream of mucus reaches the region of the anal opening it meets with some obstruction. The parts here are more firm and the frequent contractions of the sphincter muscles interfere to some extent with its onward course; this impediment, however, does not permanently restrain its progress, but changing its course it again follows the line of least obstruction and burrows downward and under the skin about the anus and buttocks, forward to the perineum and scrotum, and backward into the space between the rectum and coccyx. The latter space is a favorite spot for the establishment of mucus reservoirs, as the tissues therein are peculiarly adapted for its invasion.

"It is not unusual to find a channel running from some point near the anus, either in front or behind the rectum, directly upward for a distance of 5 to 6 inches (12.7–15.2 cm.). Again, it may burrow along just under the skin in any direction. I have seen

channels extending for a distance of 7 to 10 inches (17.7–25.4 cm.) directly backward over the coccyx and forward along the perineal raphi, around the scrotum or surface, or from the perineum directly upward, and ending over the pubic bone.

“The external effect of this exudate is to render the integument about the anus puffy and hypertrophied, and all parts involved give evidence of distention. Changes in the color of the skin are common in spots, being darker than normal, or they may appear slightly excoriated. Not infrequently the exudate invades the skin itself and slowly but persistently oozes through it to the surface, producing the annoying moisture of the parts which by some writers is termed ‘perspiration’” (Albright).

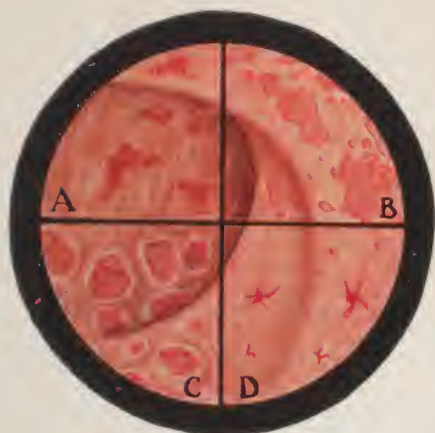
In cases of chronic proctitis the author has frequently encountered short and long submucous and subcutaneous fistulæ that traveled an irregular course and contained pus or a mucopurulent discharge, and treated several cases of mucous cysts, but has not observed these so-called mucus-filled channels. He has also operated on several extensive fistulæ caused by probing and infecting the tissues by physicians in their effort to trace channels. It is easy to introduce a probe for almost any length beneath the mucosa or through subcutaneous fat, and no doubt channels are unintentionally made in this way from which a serous and then a seropurulent discharge later exudes. When tracts, whether mucus-filled or typical sinuses, are discovered they should be incised, drained as fistulæ.

*Condylomata* of the perianal region are occasional complications of chronic hypertrophic proctitis where acrid mucus seeps through the anus and continuously irritates the integument.

**Symptoms.**—Very often chronic catarrhal proctitis is a continuation of similar inflammatory processes involving the colon, and in such cases manifestations are typical of catarrhal colitis outlined elsewhere—abdominal pain or cramps, soreness on pressure, persistent diarrhea with stools containing an abundance of mucus, more or less pus and some blood, annoying tenesmus, indigestion, loss of appetite, emaciation, sallow complexion, and when pus or bacterial toxins have been absorbed the patient may also suffer from endocarditis, arthritis, anemic or other systemic disease the end-results of focal infection.

Patients afflicted with chronic catarrhal inflammation limited to the rectum—proctitis—complain chiefly of mild diarrhea, sometimes alternating with constipation, gaseous eructations, furred tongue, malaise, lack of energy, depression, impaired digestion, tenesmus, feeling of heat, weight, fulness in the rectum, aching pain

# PLATE III



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1. Proctoscopic view of chronic amebic colitis, showing different types of lesions: *A*, Deep mixed infection; *B*, superficial mixed infection; *C*, round, and *D*, stellate ulcers.
2. Sigmoidoscopic view of tubercular coloproctitis, showing *A*, extensive girdle; *B*, small round ulcers, and *C*, cicatricial tissue surrounding a partly healed lesion.
3. Proctoscopic view of tubercular proctitis, showing a large deep undermining girdle and smaller irregular-shaped superficial ulcers.
4. Proctoscopic view of acute amebic proctocolitis, showing round and stellate ulcers.
5. Proctoscopic view, showing small polyps, a large adenoma, and ulcers on the rectal valves and elsewhere, the result of chronic amebic coloproctitis.
6. Proctoscopic view, showing different types of polyps, ulcerated mucosa, and relation of tumors to the rectal valves.





in the lower bowel or reflected to the sacral, coccygeal, prostatic, or sciatic region, an incessant desire for an evacuation unrelieved by defecation. Stools which occur with varying frequency may be entirely mucus or composed of fluid or semisolid feces and glairy mucus containing pus and bright red or clotted blood.

The sphincter may be slightly contracted or relaxed, in which case irritating discharges ooze through it to cause excoriation of the skin, erythema, moist eczema, condylomata, pruritus ani, hypertrophy of radiating skin folds, or superficial fissures in close proximity to Hilton's white line. When straining is persistent incident to diarrhea and frequent desire for an evacuation, erosion of the mucosa or prolapsed hemorrhoids may be observed.

**Diagnosis.**—Chronic catarrhal and infectious proctitis is easily diagnosed when a clear history has been obtained, the above symptoms have been noted, and the rectum is properly examined by *digital exploration* which shows the mucosa thickened, of doughy consistence and uneven surface, in which erosions and ulcers are distinguishable, and by *proctoscopic examination*, which enables one to observe the congested, reddish, thickened, non-pliable, eroded, or ulcerated mucous membrane (Fig. 207) which is partially or completely covered with mucus or bathed in a mucopurulent discharge (see Plates II and III).

In aggravated cases of hypertrophic proctitis the rectum is rigid and non-inflatable and the bowel must be examined with aid of a speculum, and in such cases the mucosa may have a granular appearance, be dotted here and there with petechia, pin-point or larger ulcers through which blood oozes, or be covered with papillomata or fully developed adenomata—polyps.

Separation of the buttocks and anal margin assists in the diagnosis of proctitis by bringing into view anal fissures, ulcerated mucosa or hemorrhoids, hypertrophied anal papillæ, condylomata, excoriations, and other skin diseases caused by the acrid rectal discharge.

In chronic *atrophic* proctitis the mucous membrane is dry, fissured, bleeds easily, but slightly, and is dotted over with dry particles of fecal matter, constipation prevails, stools are hard, small and nodulated, and may contain a slight amount of dried mucus. Pain is local, interrupted, smarting in character, and is slightly increased by defecation.

Suspected lesions, openings, and dark or reddish spots in the skin and anal mucosa are probed for submucous and subcutaneous fistulæ and so-called mucous channels (Fig. 282).

**Prognosis.**—Patients suffering from neglected cases of coloproc-

titis complicated by ulceration, infection, and diarrhea are greatly depleted and require considerable treatment, but are curable with few exceptions.

Chronic hypertrophic proctitis is a distressing ailment, but one easily controlled after the plan given below. The disease ends fatally only in neglected cases where the bowel has been permitted to become extensively ulcerated, strictured or infected, and extensive abscesses and fistulæ have formed that caused exhaustion or perforate the rectum, causing peritonitis.

**Treatment.**—Routine measures are impractical and the treatment must be varied in different cases of chronic catarrhal proctitis because the disease may be independent or continuous with sigmoiditis or colitis, inflammation may be of the *atrophic* or *hypertrophic* type, catarrh of this region is sometimes caused by other rectal affections, and has been induced by or associated with systemic disease.

Elsewhere the author has outlined hygienic, medical, and surgical measures employed in the treatment of *coloproctitis*, and here will limit the discussion to therapeutic agents useful in curing chronic inflammation confined to the rectum.

Patients thus afflicted recover more quickly when hygienic surroundings are improved, they are permitted a nutritious diet composed chiefly of nitrogenous food and milk—coarse vegetables, ices, alcoholic beverages, tea, coffee, and condiments being interdicted—eat regularly, abstain from social and business engagements during exacerbations of the disease, and spend their idle time in the open air.

Gentle massage, electricity, hydrotherapy—water drinking, ordinary and medicated baths—blood and nerve tonics are useful for building up the system of emaciated, anemic, and patients exhibiting manifestations of auto-intoxication. Bismuth, thymol, salol, or betanaphthol, gr. x (0.6), employed alone or in conjunction with an astringent—tannigen, tannalbin, or ichthoalbin, gr. v to xv (0.3–1.0)—administered three times daily diminish intestinal irritability, modify fermentation and putrefaction, favor healing, and lessen frequency and fluidity of the evacuations.

Constipation alternating with diarrhea is relieved by an occasional dose of castor oil, ℥j (30.0); calomel, gr. iij (0.2), in broken doses, or a warm oil enema, Oss (250.0), containing inspissated ox-gall, ℥ij (60.0), which painlessly evacuates retained scybalæ.

Local and reflected pain, tenesmus, and colic not relieved by rest, dieting, heat, and above agents are controlled by opiates

administered as often as required—morphin, gr.  $\frac{1}{4}$  (0.016); opium extract, gr.  $\frac{1}{2}$  (0.03), or codein, gr.  $\frac{1}{4}$  (0.016)—but when cramps—enterospasms—are not relieved in this way belladonna, gr.  $\frac{1}{4}$  (0.016), is combined with the opiate.

Suppositories composed of cocain, gr.  $\frac{1}{6}$  (0.01); belladonna extract, gr.  $\frac{1}{4}$  (0.016); ichthyol, gr. ij (0.12), and cocoa butter, inserted two or three times daily, relieve discomfort and stimulate healing of erosions and ulcers in the mucosa.

Irrigations and enemata are effective in this class of cases, but the former are preferable, since the latter induce more or less distention pains.

Rectal lavage and medicated irrigation clears the bowel of irritating scybalæ, mucous discharge, food remnants, bacteria, and toxins, soothe the mucosa, reduce inflammation and rapidly heal erosions and ulcerated areas, best results are better when treatments are made once or twice daily, lasting from twenty to thirty minutes. Irrigation is accomplished with the aid of a recurrent flow, soft or hard rubber or metallic irrigator (Figs. 722, 878), and from  $\frac{1}{2}$  to 1 gallon (2000–8000) of the solution is employed, which is used cold (65° F.) unless enterospasm, tenesmus, and sphincter-algia are troublesome, when it is employed warm (100°–125° F.) to soothe and allay irritability of the anorectal muscles.

Normal saline, boric acid, flaxseed tea, and weak carbolic acid solutions are helpful in the preulcerative stage of rectal catarrh, but stronger solutions are required when erosions or ulcers appear in the mucosa, of which ichthyol, balsam of Peru, 2 to 5; argyrol, 5; potassium permanganate, 1 per cent., or silver nitrate, gr. v to Oij (0.30 gm.—1000 c.c.), have proved most satisfactory in the author's hand. When discharge is copious and hemorrhage debilitating strength of the solution is doubled for a few days, but when acute symptoms have subsided satisfactory results are obtained with the accompanying prescription:

R.	Fluidext. krameria.....	℥iv	120 0;
	Sodii biboratis.....	℥ij	8 0.—M.
Sig.—Half-tablespoonful in a quart of water, and irrigate daily.			

The rectum is irrigated with the patient in the prone, Sims', or knee-chest posture, or the solution or emulsion may be speedily deposited in the rectum and sigmoid flexure with the subject placed in the everted posture (Fig. 210) by using the author's funnel proctoscope and pitcher; when the sufferer has coloproctitis his position is changed during irrigation so that the solution reaches lesions on every side of the bowel and all segments when the colon is also involved.

The *local* treatment, which is important in chronic catarrhal proctitis, consists in making *topical applications* to lesions, *fulgurating* sluggish ulcers, papillæ, and polyps, and *insufflating* the inflamed rectum with soothing and healing *powders*.

Topical applications (Fig. 210) of ichthyol, balsam of Peru, 10; silver nitrate, 6, or argyrol, 20 per cent., made to erosions or



Fig. 210.—Ulcerative proctosigmoiditis. Method of making topical applications to lesions in the anal canal, rectum, or sigmoid flexure through the proctoscope or sigmoidoscope with patient in the inverted posture.

ulcers allay rectal irritability, diminish hemorrhage, lessen discharge and promote healing, used independently or in conjunction with treatment above outlined, but in exceptional instances when stimulation aggravates the condition, lesions or the entire rectal mucosa are swabbed with methylene-blue, 10 per cent., which soothes the irritable bowel and hastens convalescence.



Following irrigation and drying of the mucosa the author frequently alternates topical applications with rectal insufflation, using one of the dry powder formulæ given below, which renders the patient more comfortable and tends to diminish catarrhal inflammation:

R.	Tannic acid.....	℥ss	20;
	Bismuth subnit.....	gr. xx	13;
	Pulv. alum.....	℥ss	20;
	Pulv. talcum.....	℥j	300.—M.

Sig.—Insufflate the rectum and sigmoid flexure every other day through a proctosigmoidoscope.

R.	Boric acid.....	℥j	300;
	Hydrarg. chlor. mit	}.....āā	℥ij 80.—M
	Orthoform		

Sig.—Insufflate the bowel thrice weekly until rectal irritability is overcome.

*Spraying.*—Medicated antiseptic astringent and soothing solutions sprayed into the rectum through a proctoscope (Fig. 211) are healing.

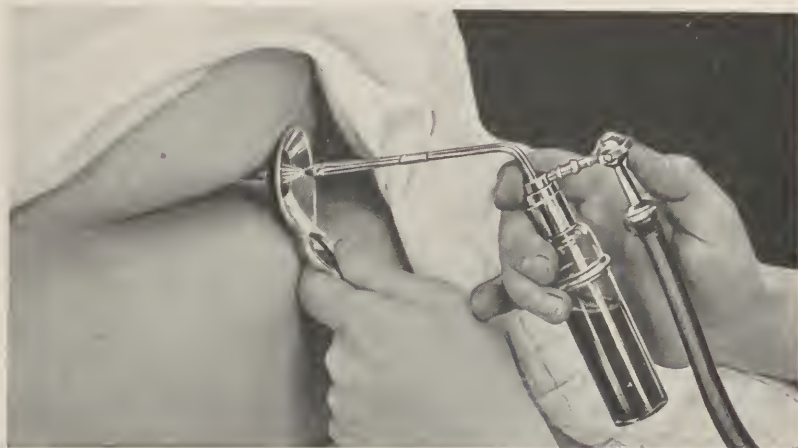


Fig. 211.—Spraying sigmoid flexure and rectum through the proctosigmoidoscope with antiseptic astringent solution to relieve proctosigmoiditis.

*Fulguration* with a controllable high-frequency spark is a valuable adjunct in the treatment of aggravated cases of chronic catarrhal proctitis because with the spark one can stimulate sluggish lesions, destroy overhanging edges of mucosa, papillomata, and large and small polyps by fulgurating their pedicles, which causes them to drop off.

**Surgical Treatment.**—Surgery is indicated in the treatment of chronic rectitis when hemorrhoids, large adenomata, procidentia

recti, fissures, anal hypertrophied papillæ, sphincteralgia, cryptitis, pruritus ani, abscess, or fistula complicate the condition, because catarrhal inflammation often persists until these sources of irritation have been removed by operative procedures outlined in separate chapters set apart for these affections.

Surgical intervention is also required when obstinate coloproctitis or catarrhal proctitis does not respond to irrigation and medical treatment. Under such circumstances an *inlet* is made in the appendix—*appendicostomy*—or cecum—*cecostomy*—so that effective *through-and-through* medicated irrigation may be carried out daily. Gant's *ileocecostomy* is substituted for appendicostomy and cecostomy when there is catarrhal *ileocolitis*, because this procedure enables one to separately or simultaneously irrigate both the small and large intestine.

*Colonic exclusion* is necessary when the entire colon is extensively ulcerated or the mucosa is studded with papillomata and small or large polyps, to put the bowel physiologically at rest, but better results follow the operation when drainage and irrigation of the excluded gut are also provided for by *appendicostomy* or *cecostomy*.

*Colostomy* may be employed for the same purpose, but less often because of its disgusting features and necessity of a second operation to close the stoma. The formation of an artificial anus is occasionally compulsory in aggravated proctitis to keep lesions free of feces, permit thorough rectal irrigations in cases where exclusion of the terminal bowel is impracticable.

*Colectomy* and *proctectomy* are seldom performed for the relief of colitis and proctitis because they are difficult and dangerous, and the disease is usually cured by less objectionable procedures.

In addition to the above it is advisable in cases of *atrophic* proctitis to cleanse and dry the anus with cotton following defecation, since rough paper cracks the fragile mucosa and perianal skin, and to apply the accompanying mixture or ointment to the skin and anal canal to soften the parts and promote healing:

R̄.	Acid salicylici. . . . .	gr. xxv	1/6;
	Acidi carbolic. . . . .	ʒj	40;
	Glycerini. . . . .	ʒj	30/0.—M.

Sig.—Swab the perianal region once or twice daily.

R̄.	Morphinæ sulphatis. . . . .	gr. vij	0/50
	Hydrargyri chlor. mitis. . . . .	gr. xij	0/8;
	Ext. belladonnæ. . . . .	gr. x	0/6;
	Bismuth oxidi. . . . .	gr. xvj	1/0;
	Ungt. zinc oxidi. . . . .	ʒj	30/0.—M.

Sig.—Apply intrarectally with pile-pipe and to the perianal skin daily to prevent and heal erosions.

## INFECTIOUS SPECIFIC PROCTITIS

In North America catarrhal hypertrophic and atrophic are encountered very much more frequently than *infectious proctitis*



Fig. 212.—Proctoscopic view of extensive tubercular ulcerative coloproctitis. Probe inserted to indicate undermined mucosa.

and *coloproctitis*, but the latter is more prevalent than the former in the Philippine Islands, Cuba, China, Japan, and tropical countries where dysentery is endemic and epidemic.

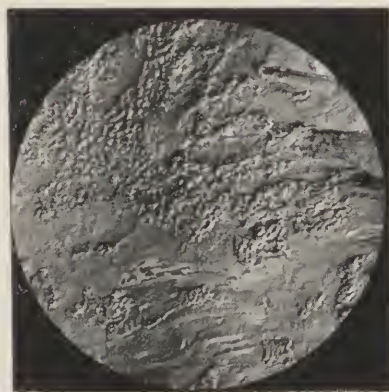


Fig. 213.—Pseudomembranous amebic coloproctitis.

Many varieties of infectious proctitis or coloproctitis have been encountered in the States—*tubercular* (Fig. 212), *syphilitic*, *gonorrheal*, *amebic* (Fig. 213), *bacillary*, *balantidic*, *flagellata*, *ciliate*,

*coccidic*, and *helminthic*, and of these the first four are most often met with.

These types of proctitis may be *primary*, where infection originates in vaginal discharges that run over the anus or is caused by specific organisms transported to the anus by fingers, toilet paper, introduction of unsterilized specula, proctoscopes, instruments, enema, or irrigating tubes previously used on patients suffering from infectious coloproctitis, but is *secondary* to *tubercular*, *amebic*, *bacillary*, or other variety of infectious colitis in more than 90 per cent. of cases.

Primary specific colitis is most often gonorrheal and caused by dribbling over the anus of infectious vaginal discharges. The author has observed inflammatory and ulcerative lesions in the anal canal induced by the secretion from labial and perianal *chancreoids*. In 3 of his cases gonorrheal proctitis was contracted during pederasty, the passive pederast being infected in each instance. Rectal gonorrhea has been traced to infected unclean orderlies and nurses, which accounts for frequency of the disease among infants and children, particularly those afflicted with vaginitis.

The author has not attempted a complete discussion of the *etiology*, *pathology*, *symptoms*, *diagnosis*, and *treatment* of different types of *infectious proctitis*, since they differ but slightly from similar infections involving the colon, which are usually responsible for the rectal condition; diseases that have already received full consideration elsewhere. The treatment of *infectious* and *catarrhal* rectitis differs but slightly. *Sera* are useful in *bacillary*, *antiluetic* agents are imperative in *syphilitic*, and *hygienic measures*, *carefully regulated nourishing diet*, and *remedies that strengthen the system* are necessary in the treatment of *tubercular proctitis*.

*Gonorrheal* infection has been discussed in Chapter XLIV along with other venereal diseases of the anorectal region, and under the caption of Gonorrheal Colitis, where the author mentions several adults and reports cases of 6 children treated by him for gonorrheal coloproctitis.

*Hemorrhagic* proctitis is usually an extension of hemorrhagic colitis, and because of this further discussion of the subject here is unnecessary.



## Chapter XVII

### Perianal, Ischiorectal, Perirectal, and Pelvirectal Abscesses—Periproctitis

**General Remarks.**—Approximately one in every five persons applying for treatment for anorectal diseases seek relief from abscess or fistula, its sequela.

Periproctitis—abscess—has been encountered at all ages, but is most common during the active years (twenty-five to forty-five) of life, is occasionally observed in children, and very rarely met with in babies.

The author has operated 50 times for abscesses in children varying in age from ten to fifteen years, 25 times from one to ten, and 8 times in infants, one of which was only a week old.

*Occupations* that are sedentary or subject individuals to exposure, bruising of the buttocks, or violent straining are predisposing factors in perirectal abscess.

*Sex* is apparently a contributing cause of periproctitis, certainly men suffer from it much more frequently than women (5 to 1), probably owing to their more arduous and exposed occupations.

Periproctitic abscesses are most often encountered in robust and otherwise healthy individuals, but are occasionally met with in persons emaciated or who have some wasting disease or suffer from constipation and auto-intoxication, diabetes, tuberculosis, or syphilis, which renders them an easy prey to septic organisms.

Perianal and perirectal abscesses may be *single* or *multiple*, *large* or *small*, located beneath mucosa or skin or in deeper structures, and be tubercular or of the ordinary infectious or phlegmonous types.

Anorectal abscesses heal quickly when radically operated and drained early, but when opened by a *stab* incision or neglected they terminate in *fistula in ano*.

Not more than 3 per cent. of abscesses operated by the author result in fistula, but a study of dispensary and hospital statistics has convinced him that fistula follows in about 60 per cent. of abscess cases operated in the usual way, owing to the poor technic and faulty postoperative treatment practised by the family physician or surgeon.

## ETIOLOGY

Abscesses of the anorectal region result from infection in which colon bacilli, staphylococci, streptococci, or tubercle bacilli are the chief factors, but other pathologic organisms at times participate in the infective process.

Periproctitis—infection—frequently encountered, is usually secondary to inflammation of the rectum, traumatism of the mucosa, injuries, other rectal disease, or anything that breaks continuity of the epithelium, and is ordinarily preceded by erosions, ulcers, or lacerations in the mucosa that pave the way for entrance of pus-forming cocci and bacilli into the blood or lymphatic circulations.

The anatomic arrangement of the rectum, abundant areola tissue about it, activity of the adjacent muscles, and daily traumatism and incident evacuation of feces favor the formation of anorectal abscess.

*Colon bacilli* are very often encountered in periproctitis alone or with staphylococci, streptococci, or both, but when all are present it is difficult to determine which organism originated the infection. In the absence of lesions in the mucosa, where infection occurs, it is considered possible that pathogenic micro-organisms reach the lymphatics, blood, and structures outside the bowel by *osmosis*, or penetrate into or through the mucosa under favorable circumstances.

*Tubercle bacilli* are responsible for anorectal abscess in not more than from 3 to 5 per cent. of cases. *Gonococci* were discovered in pus in 6 of the author's cases—2 ordinary and 4 phlegmonous abscesses—and of this series, 4 patients suffered from gonorrhea of the rectum, 2 of whom admitted having indulged in pederasty.

In addition to pathogenic organisms mentioned the author has discovered Shiga bacilli, *Balantidia coli*, *Entamebæ hystolytica*, and thread-worms in abscesses of the anorectal region, and cases of periproctitis induced by *Bilharzia*, *Bilharzia hematobia*, and *actinomyccoccus*—ray fungus—have been reported.

The author has treated 3 abscesses caused by injuries that punctured the bowel and allowed feces to escape into the perirectal areola tissue, and 10 patients for abscess and fistula resulting from buried foreign bodies: dried apple peel, 1; pin, 1; fish bones, 2; piece of glass, 1; fecoliths, 2; tape-worm segment, 1; piece of cotton, 1; bismuth enterolith, 1.

Often it is difficult or impossible to determine the cause or trace the route of the agent responsible for infection near or distant

to the rectum, but septic organisms presumably follow lymphatics more often than blood-vessels.

**Predisposing Causes.**—Prominent among contributing factors in anorectal abscesses are sedentary and occupations that subject the individual to bruising of the buttocks, uncleanness, exposure, sitting on damp and cold seats, horseback riding, falls, kicks, constipation, emaciation, lowered vitality, and wasting disease.

**Direct Causes.**—Rectocolonic affections, catarrhal, tubercular, syphilitic, entamebic, balantidic, bacillary, gonorrheal, flagellate and coccidic colitis, benign and malignant tumors, ulceration

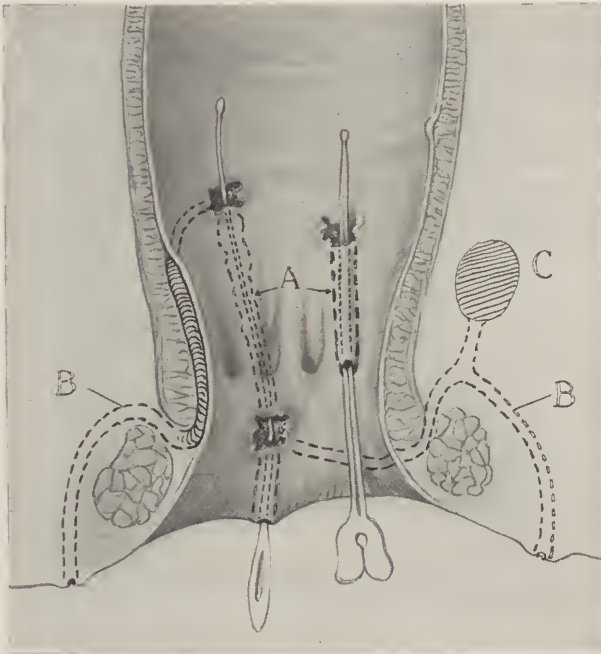


Fig. 214.—A, Sinuses connecting ulcerated areas; B, fistula arising from rectal ulceration; C, abscess.

(Fig. 214), fissures, stricture, cryptitis, external and internal hemorrhoids, procidentia recti, diverticulitis, perforating and puncture wounds, injuries causing laceration or necrosis, foreign bodies, careless digital and instrumental examination, employment of imperfect syringe nozzles, chancres and chancroids, congenital and secondary syphilitic lesions, pruritus ani, herpes, eczema, dilatation of the sphincter, cauterization of the mucosa, and unhealed rectal wounds have all caused anorectal abscess with greater or less frequency.

A study of etiologic factors in septic periproctitis indicates that anything which inflames, bruises, lacerates, punctures, or causes sloughing of the mucous membrane or deeper rectal structures may be set down as a cause of anorectal abscess, since they pave the way for pathogenic micro-organisms into the blood and lymphatic channels, permit the escape of seeds, feces, foreign bodies, and toxins into the perirectal areola tissue that lead to abscess through irritation or infection.

**Disease of Other Organs and Structures.**—Infection of the spine, hip, bladder, urethra, prostate, vagina, urethra, seminal vesicles, tubes, ovaries, or abdominal organs accompanied by discharge occasionally induces perirectal or ischiorectal abscess where pus works downward along the rectum.

*Bartholin's glands* now and then become infected and abscess forms in one—usually left—or both labia (Fig. 217, *B*), and occasionally the discharge burrows downward and opens into the rectum or forms a secondary abscess in the perianal region (Fig. 280).

Occasionally in diphtheria, pneumonia, and acute septic infections of the bowel enormous sloughs appear in the rectal mucosa, a condition now and then complicated by abscess.

Jamison and Albright describe subcutaneous and submucous channels containing mucus caused by proctitis (Fig. 281) that may become infected and form abscesses.

The author has treated 2 patients for multiple, long, submucous, and subcutaneous fistula referred by Dr. Jamison, who had been treating them for so-called "channels," both of whom were cured by incising and draining the tract as in fistula operations.

*Fissure in ano* is a common source of posterior anal abscess because the rent affords a lodging place for infectious material.

*Thrombotic hemorrhoids* frequently terminate in marginal abscess where septic organisms gain entrance to and infect the clot through hair-follicles or necrotic ulcers.

*Internal hemorrhoids* occasionally lead to abscess when ulcerated, strangulated, or they slough following escharotic applications or the injection of carbolic acid.

*Benign and malignant neoplasms* are responsible for abscess and fistula where tumors degenerate and crater-like ulcers form that catch feces, and when growths block the bowel causing constipation, fecal impaction, and formation of stercoral ulcers.

*Dermoid cysts* of the sacrum sooner or later become infected and terminate in abscess.

*Necrosis of the coccyx or sacrum* in bone tuberculosis, syphilis,



or cancer is occasionally complicated by the formation of pus pockets of the anorectal region.

*Submucous* and *sebaceous glands* may become infected, and pus from them may reach nearby or distant tissues, causing submucous, subcutaneous, or deep-seated abscess.

*Diabetes* is a rare cause of anorectal abscess.

In a number of instances the author has treated abscesses induced by a *fall, kick or bruise*, punctured wound, and buried fecoliths or foreign bodies.

*Ragged, unlevel, partially bridged over, unhealed, and improperly treated wounds* are a frequent source of perianal and perirectal, periproctitic abscess; and *probing* of wounds, fistulæ, and so-called mucous channels where the instrument penetrates granulations, fistula wall, or areola tissue is also a potent factor in anorectal abscess.

#### PATHOLOGY

*Pericolitis* is characterized by an acute or chronic inflammatory process that usually results in the formation of adhesions without pus.

*Periproctitis* incident to proctitis, abrasions or ulcers in the mucosa, and escape of colon bacilli, streptococci, staphylococci, or other septic organisms into the bowel wall and perirectal structures is usually complicated by the formation of circumscribed abscesses or a diffuse phlegmonous inflammation ending in slight or marked *sloughing* of the bowel and adjacent tissues.

The character and limitations of the infection depends chiefly on the *organisms* responsible for it, manner of their transportation, and distance to which they are carried, for when *infected* material enters the lymphatic circulation it may be carried downward subcutaneously to the ischiorectal fossa or upward into the retro- or pelvirectal space. When bacilli or cocci enter different lymph-channels multiple abscesses form in parts near or distant to each other.

In large anorectal abscesses pus may be restricted to a single *sac* or be found in a number of unconnected *loculi* (Fig. 216), and in either case when the abscess is not promptly operated pus quickly accumulates, breaks through the wall, infection extends in the direction of least resistance, and forms pus pockets near or at a considerable distance from the original focus of infection.

Occasionally periproctitic inflammation disappears spontaneously, and some authorities claim that pus accumulations may be absorbed, but the author has not known this to occur, and

believes once an abscess has formed it enlarges rapidly unless it ruptures into the bowel or through the skin or pus is evacuated by operation.

Subtegumentary pus accumulations may open into the rectum or extend to the ischiorectal or perirectal spaces, while abscesses originating higher up sometimes perforate the bowel, dissect mucosa from the muscular tunic, or rupture through the skin.

Pus originating in vicinity of the vaginal, vesical, urethral, or prostatic region (Fig. 215) forms abscesses *anterior* (Fig. 216) to, while that from other regions terminates in *lateral* or, in rare instances, *posterior* anorectal abscess.

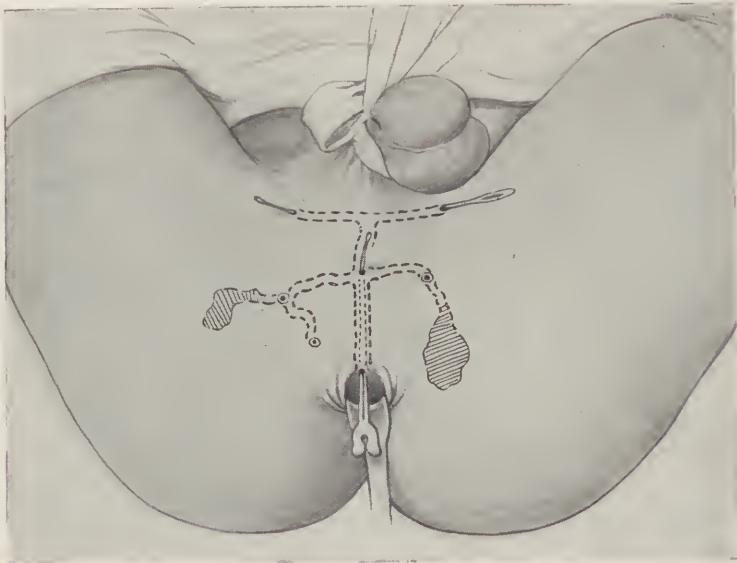


Fig. 215.—Complex fistula and multiple abscesses caused by an infected prostate gland.

Collections of pus in the anal and perianal regions may remain outside the bowel, penetrate the muscular coat, or enter the rectum in neglected cases. In fully formed abscesses where considerable pus has been permitted to accumulate it exerts marked pressure and may dissect the peritoneum upward, cause sloughing of the rectal wall, or through pressure necrosis rupture into the *urethra*, *vagina*, *bladder*, or *abdomen*, forming *urethral*, *vaginal*, *vesical*, or *abdominorectal* fistula.

Acute infections progress rapidly and in two or three days encroach upon bowel or skin, are accompanied by septic manifestations, and characterized by swollen, tender mucosa, indurated

area about the rectum, tender swelling beneath the skin, which gradually becomes red, very sensitive, continuous throbbing pain, fluctuation, and the integument assumes a purplish hue shortly before rupture of the abscess occurs (Fig. 216).

Infections secondary to *bilharzia* and *actinomycosis* pathologically resemble abscesses from other causes, except that in the former the rectum and bladder are extensively ulcerated and pus from them contains worms, *Bilharzia hematobia*, eggs, or the ray fungus.

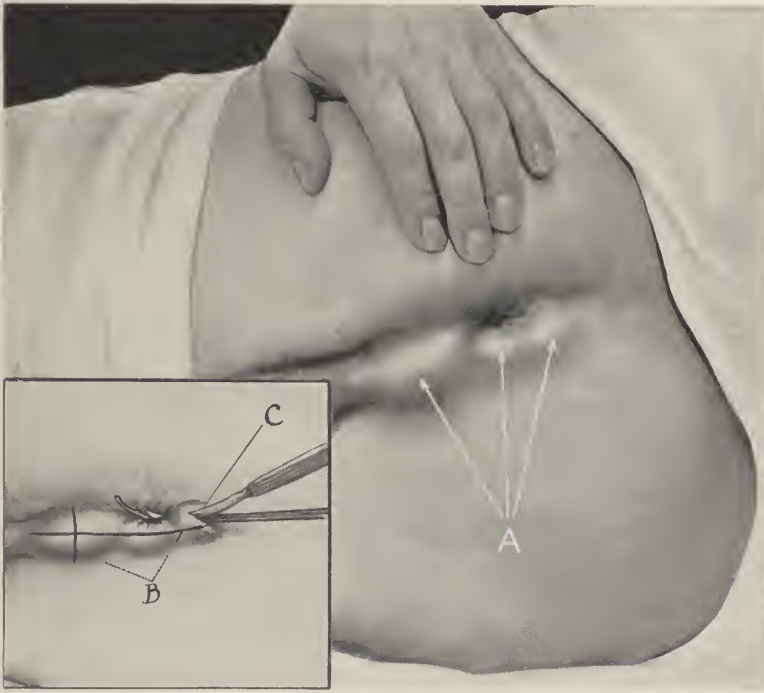


Fig. 216.—Triple abscesses and blind internal fistula: *A*, Perianal and perineal abscesses; *B*, lines of incision made when incised; *C*, division of blind internal fistula under local anesthesia.

*Cold tubercular chronic* abscesses of the ischiorectal or pelvi-rectal region originate in a tubercular sacrum, spine, or hip-joint, and require weeks or months to cause the same degree of suffering and destruction of tissue as is induced by an ordinary abscess in a few hours or days.

Malignancy of the rectum may extend in any direction and cause secondary small or large abscesses in the submucosa or peri-rectal region.

Bartholin's gland infection develops slowly, the abscess varies from olive (Fig. 217, *B*) to egg size, is very sensitive, and accumulated pus discharges through an outlet superficially near the anus or ruptures into the rectum anteriorly  $\frac{1}{2}$  inch (12.7 mm.) above the anus.

In rare instances periproctitis is violent—*fulminating*—and the patient dies of sepsis in a few days unless the rapidly extending infectious process is quickly arrested.

*Perirectal* and *perianal* abscesses are usually located at the side of the rectum, but are occasionally encountered anteriorly or posteriorly to the bowel; in 95 per cent. of cases they perforate the anal canal in the posterior median line  $\frac{1}{2}$  inch (12.7 mm.) above the anus at the sphincteric juncture (Fig. 217).

Pus accumulations located anterior or posterior to the rectum are usually secondary to spinal, pelvic, hip-joint, vesical, prostatic, urethral, or affections of the uterus, vagina, adenexa, coccyx or sacrum, or caused by foreign bodies, injuries, or disease in Bartholin's gland.

#### CLASSIFICATION

It is impossible to arrange a classification of perirectal and perianal abscesses that would meet conditions in all cases, because they may be *low* or *high*, *single* or *multiple* (Fig. 222), *circumscribed* or *diffused*, *acute* or *chronic*, located *in* or *outside* the bowel or *beneath the perianal skin*, and induce unimportant *local* or dangerous *constitutional manifestations*, and, further, because some types are *common* and others *rare*. Infection causing them may be *tubercular* or *non-tubercular* and involve the anus or rectum.

The following classification of anorectal abscesses will serve as a satisfactory basis for the study of periproctitic abscesses:

Superficial—Infralevator.....	{ Follicular—tegumentary. Subcutaneous—marginal. Ischiorectal.
Deep—supralevator.....	{ Retrorectal. Superior pelvirectal.
	Submucous—intermural.
	Interstitial.
	Tubercular.
Miscellaneous.....	{ Bartholin's gland. Gangrenous—periproctitic cellulitis. Diffuse septic. Diphtheric.



From this classification it will be seen that the levator ani muscle is the dividing line between superficial—*infralevator*—which are not very serious, and deep—*supralevator*—or profound abscesses.

**Follicular—Tegumentary Abscesses—Furuncles.**—Follicular abscesses (Fig. 217) are frequently encountered in the perianal region and upon the buttocks, but seldom require treatment, since

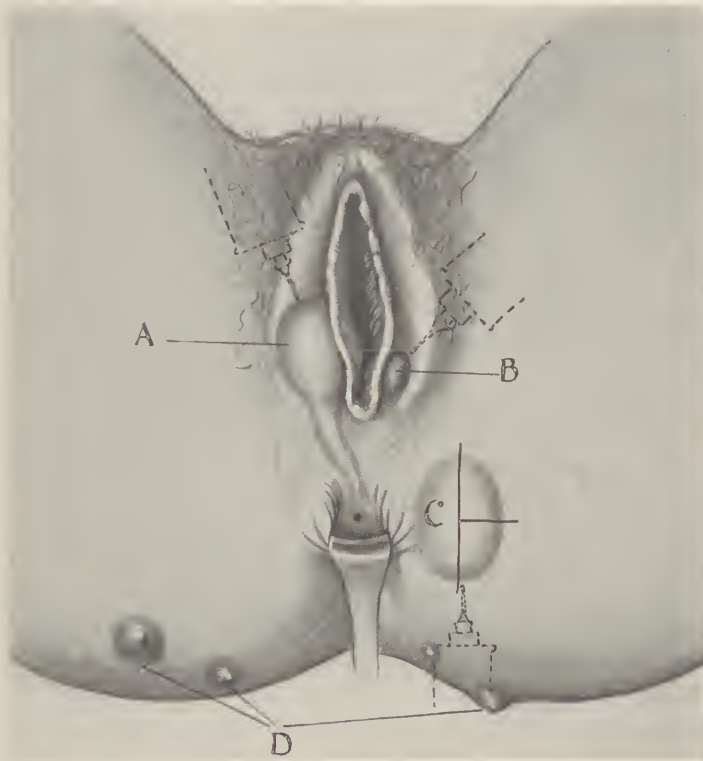


Fig. 217.—Different varieties of abscess: *A*, Labial abscess and subcutaneous fistula opening anteriorly at the anus; *B*, Bartholin's gland abscess; *C*, ischioanal abscess and lines of incision made when operating upon it; *D*, follicular—cutaneous—tegumentary abscesses—furunculosis.

they induce slight discomfort and usually disappear spontaneously. Ordinarily follicular abscesses are traceable to excessive perspiration, walking, riding, irritation by clothing, uncleanliness, discharges that seep through the anus, bathing in polluted water, or erosions and other lesions in the skin or mucosa responsible for irritation, inflammation or infection of hair-follicles or glands located in the perianal skin and buttocks.

Furuncles are met with more frequently in males than females and persons between ten and thirty-five years of age, and occur most often on the buttocks of boys who swim in shallow water which is covered by a greenish scum during hot weather or so-called dog days.

Follicular abscesses vary from bird-shot to hazelnut size, are sensitive to touch, and appear as reddish cone-shaped elevations (Fig. 217) having a whitish peak containing a droplet of pus. Generally these infections are single or few in number, and heal promptly following rupture or evacuation of pus, but sometimes they are numerous, large, and terminate in the formation of complete or blind fistula.

Occasionally closely lying infected foci coalesce to form a painful, purplish, ovoid swelling, olive or larger in size, resembling a carbuncle of the neck. Each abscess contains a little pus and core of necrotic tissue, and adjacent follicles and glands soon become involved unless they are painted with iodine and protected from the discharge, and the original infection is promptly arrested. Furuncles frequently complicate *pruritus ani*, where the patient scratches and infects the skin.

*Symptoms and Diagnosis.*—Follicular abscesses are ushered in by itching, stinging, and pricking sensations, and as glands and skin become swollen, reddened, and sensitive cause considerable discomfort when the patient walks or sits on a firm seat.

When of considerable size and fully developed they resemble boils elsewhere and cause sharp pain until they rupture or pus is evacuated by operation. They are very sensitive and induce constant annoyance and sphincteralgia when located in the perineum or in close proximity to the anus.

Usually infection is circumscribed, but may extend, leading to deep abscesses, under which circumstances and when furuncles join to form a large carbuncle-like swelling, the patient complains of malaise, has a coated tongue, throbbing pain, accelerated pulse, and other septic manifestations.

Since there is no danger of confusing furuncles with other abscesses of the anorectal region, a further discussion of their diagnostic characteristics would be superfluous.

*Treatment.*—Hot fomentations and poultices relieve suffering, but do not arrest infection, hence the author relieves the patient with morphin until abscesses or boils are incised and drained. Furunculosis may be restricted by painting the buttocks with iodine.

Heitsman claims success in the treatment of follicular abscesses

with an ointment composed of salicylic acid 10 per cent., glycerin ointment 90 per cent., and Swinburne succeeded in aborting them by injecting a strong salicylic acid solution into infected follicles, but these remedies are unreliable and the latter induces more pain than incising and draining the furuncles under local anesthesia.

Some surgeons advocate free incisions, but the author considers them unnecessary and hazardous since pus and necrotic tissue are superficial and can be dealt with by shallow cuts and,

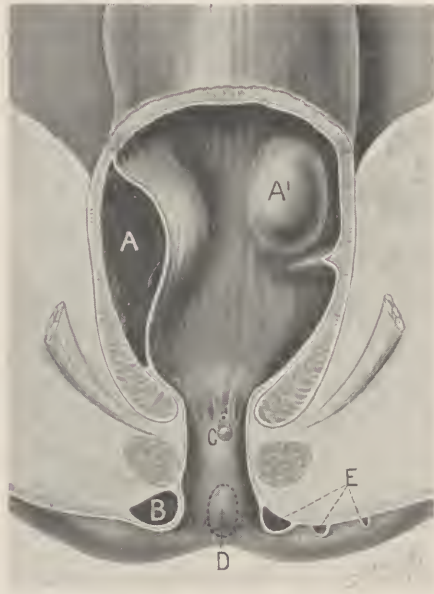


Fig. 218.—Types of anorectal abscess: *A*, retrorectal abscess bulging the bowel inward; *A'*, submucous intramural abscess; *B*, subcutaneous marginal abscess; *C*, infected crypt abscess; *D*, mucocutaneous marginal abscess; *E*, follicular tegumentary cutaneous abscesses—furunculosis (see Fig. 217).

further, because deep incisions have been followed by secondary abscesses near or distant to such wounds where septic organisms gained entrance to lymphatic vessels.

The author infiltrates each furuncle or carbuncle-like swelling with a eucain solution ( $\frac{1}{8}$  per-cent.) until white, and incises it, evacuates pus, and removes the *core* and necrotic tissue with a curet, following which the abscess cavity is irrigated with carbolic acid or full strength ichthyol and drained with gauze. Subsequently hot boric acid fomentations are employed to relieve pain and cleanse the parts and necrotic tissue is destroyed with calomel.

Stimulating applications are seldom required, since the wound usually heals quickly. Where furuncles are multiple each in turn are similarly treated.

When infected foci are scattered over the buttocks and recur, autogenous vaccines are employed, but in the author's practice they have proved effective in some and unreliable in other cases.

**Subcutaneous Marginal Abscess.**—Superficial, perianal, or marginal abscesses (Figs. 218, *D* and 219) are common, occurring most often during the active periods of life, are encountered more frequently in men than women, and are more extensive than furuncles.

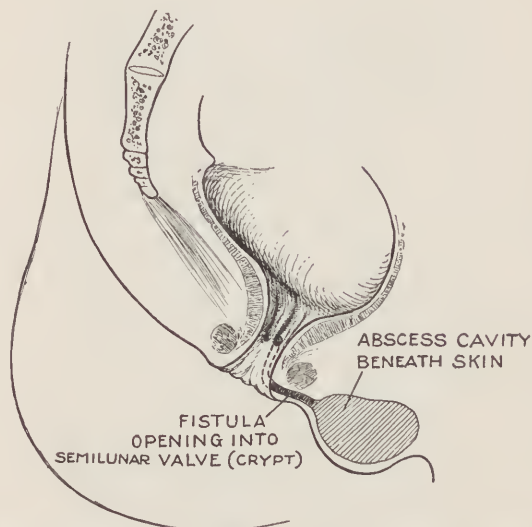


Fig. 219.—Subcutaneous marginal abscess opening in an anal crypt.

This type of superficial infection, terminating in abscess, is encountered in close proximity to the mucocutaneous border at the side or posterior to the anus.

Perianal abscesses (Fig. 219) may be caused by tubercular, mixed, or infection induced by streptococci, staphylococci, or colon bacilli, and often are secondary to thrombotic hemorrhoids where clots become infected. They have also resulted from fissure, cryptitis, and abrasions in the mucosa caused by the expulsion of hardened feces and perianal skin lesions, eczema, herpes, etc. Occasionally marginal abscesses complicate unhealed rectal wounds, perforating ulcers, encysted foreign bodies, bowel injuries, and infection of mucous or sebaceous glands.

The circumscribed infected area may be beneath integument



or mucosa, and the abscess may rupture or septic organisms from it may be transplanted through blood or lymph channels to parts remote from the anus and cause ischio- or pelvirectal abscesses.

As a rule, perianal abscesses present as purplish, sensitive, olive-shaped swellings near the anal margin and do not resemble other periproctitic infections. If left alone pus may escape through the skin or mucosa of the anal canal or burrow through or around the sphincter, forming a blind external, complete, or corkscrew—worm-like—fistula.

*Symptoms and Diagnosis.*—Diminutive abscesses beneath the anal mucosa or skin induce slight discomfort and sphincteric uneasiness which are increased by defecation. In most instances marginal abscess is ushered in with a chill, aching body, and painful sensations in the anal region, but as pus accumulates the patient loses his appetite, has a furred tongue, rise in temperature, accelerated pulse, and complains of heat, tenderness, heavy or constant throbbing pain, sphincteralgia, urethrovesical irritability, inability to sit or stand with comfort, and sensations of fulness or pressure in or about the anus.

Pain ceases or lessens when pus is evacuated, ruptures through the skin, or burrows upward beneath the mucosa, forming an intermural abscess which is felt by the finger as a soft, boggy swelling.

In neglected cases infection extends to nearby or distant parts when the patient becomes septic, unable to void urine, suffers severely from contractions of the levator ani or sphincter muscle, and increasing throbbing pain; shortly an extremely sensitive violaceous hued tumor that distends the perianal skin or encroaches on the rectum appears, which is hard in the beginning and soft or fluctuating when considerable pus has collected.

Ordinarily marginal abscesses discharge into the anal canal through an opening located in the posterior median line at the sphincteric juncture of the skin within 1 inch (2.54 cm.) of the anus, or both forming blind internal or external or complete fistulæ sinuses that are short, superficial, and heal quickly when properly operated and treated.

Superficial or perianal subcutaneous abscesses are easily recognized when fully formed because of their ovoid form (Fig. 218), characteristic manifestations, purplish color, fluctuation, and the close proximity to the anus, but may be difficult to diagnose earlier in the absence of induration and characteristic local symptoms. When located beneath the anal skin or mucosa the sphincter and levator ani muscles are tight and resent introduction of the finger or proctoscope, but abscesses situated higher up in the rectum

cause less muscular irritability, and when examined digitally are felt as tender, soft, boggy swellings.

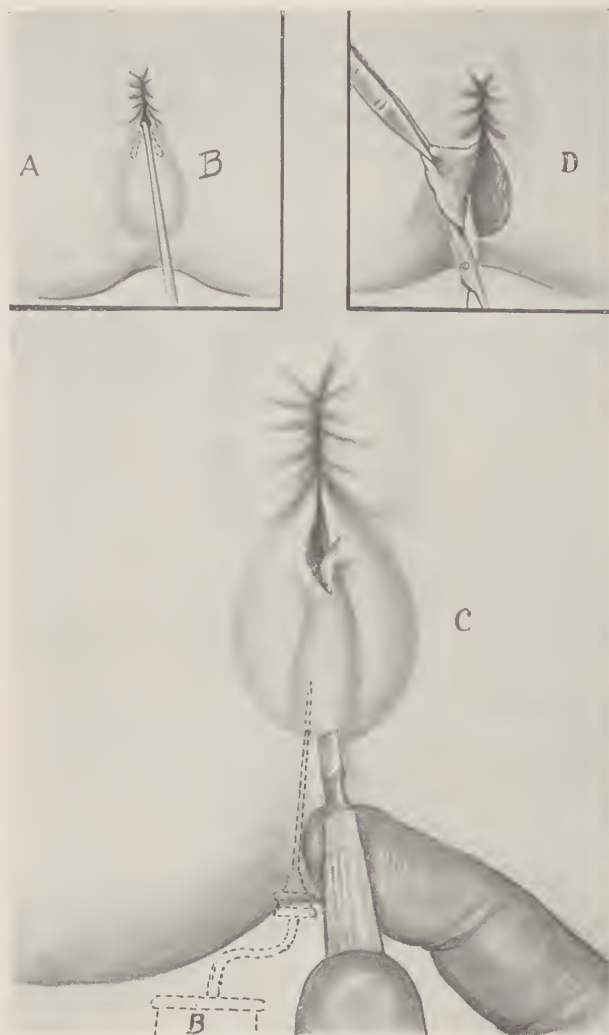


Fig. 220.—Posterior subcutaneous marginal abscess caused by an infected fissure: Insert *A*, Hooked probe inserted to indicate direction of abscess; *B*, structures external to the abscess being anesthetized with eucain. *C*, Wide incision of abscess. Insert *D*, Trimming off overhanging skin edges after the abscess has been incised, curetted, irrigated, and made ready for draining.

Marginal *tubercular* abscesses form slowly, do not cause constitutional symptoms, are not sensitive, and when ruptured a thin whitish watery discharge continually oozes through the opening,

which is large, irregular in shape, and surrounded by bluish undermined skin.

*Treatment.*—Marginal perianal abscess is a surgical condition, and time is not lost with palliative measures in attempts to prevent extension of the infection, cause the absorption of pus, or soften skin that the abscess may rupture spontaneously. Poultices and antiphlogistic remedies minimize suffering, but in the meantime pus is accumulating and burrowing through loose areolar tissue so that convalescence is extended about a week for each day operation is deferred after pus has formed.

Subcutaneous abscesses are generally small, operated under eucain anesthesia without elaborate preparation, hence there is no excuse for delaying operation.

Radical operation is desirable because it completely relieves pain, immediately arrests extension of infection, and forestalls fistula.

Following *eucainization* (Fig. 220) of overlying skin the abscess is transfixcd, slit open from end to end, cureted, cleansed, and packed with gauze after irregular wound edges and necrotic tissue have been removed (Fig. 220). Subsequently hot boric acid fomentations or irrigations are employed to diminish pain and cellulitis. The incision parallels the radial skin folds when convenient, but if not the cut is made at a right angle to them, which is preferable since the wound drains more freely.

Where an abscess has attained considerable size or there is more than one infected area a T-shaped cut or multiple incisions are made.

There is no need of dividing the sphincter unless pus passes beneath it and discharges into the rectum, but in all doubtful cases the author incises the muscle.

Ichthyol, balsam of Peru, silver nitrate (8 per cent.), and other stimulating agents are employed when healing is sluggish, but cauterization with a copper or silver stick, acids, or cautery point is unnecessary and harmful except for the purpose of destroying exuberant granulations.

**Ischiorectal Abscesses.**—Ischiorectal abscesses (Fig. 217, C)

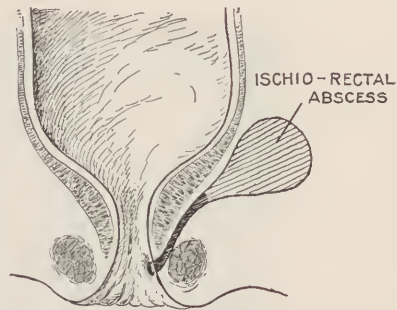


Fig. 221.—Ischiorectal abscess rupturing into the lower rectum between the sphincters.

are common, extensive, and encountered more frequently in men than women, and in clinic than private patients. Infection of the ischiorectal fossæ may be caused in a variety of ways, but usually abscesses here are traceable to a bruise, exposure, sitting on cold damp steps, fissure, hemorrhoids, proctitis, ulceration, inflamed crypts, infected mucocutaneous glands, perforating rectal ulcers, injuries or lesions that permit gas and feces containing toxins or septic organisms to escape into adjacent areola tissues, the blood, or lymph-vessels.

Occasionally ischiorectal abscesses are secondary to suppurating disease in the sacrum, spine, or pelvis, where pus follows the rectum downward, or neglected skin and marginal abscesses that enlarge, infect the lymph, or rupture into surrounding fat.



Fig. 222.—Double symmetric ischiorectal abscesses communicating with each other posteriorly by a horseshoe fistula and with the rectum through an opening in the posterior median line  $\frac{1}{2}$  inch (12.7 mm.) above the anus (see Fig. 223).

Once an abscess forms in the ischiorectal fossa it rapidly extends through the areolar tissue, which offers little resistance, and pus accumulates and fills the intervening space between the rectum and ischium. Pus in this region is restricted above and internally by the lower border of the levator ani muscle and rectum, and externally by the obturator fascia, hence it works downward encroaching upon the skin. Occasionally, however, it follows the muscle and breaks through into the other ischiorectal space at the point where the levator ani joins its fellow on the opposite side of the rectum, thus forming a double or horseshoe abscess (Fig. 222).

Bilateral abscesses (Fig. 223) and horseshoe fistulæ (Fig. 223) are often formed in this manner. Less often pus from an ischiorectal abscess burrows across the perineum (Fig. 223) or beneath subcutaneous fat, behind the anus, and infects areolar tissue on the



opposite side of the bowel, or escapes through the labia, vagina, bladder, or urethra, leaving a horseshoe, rectolabial, rectovaginal, rectovesical, or recto-urethral fistula.

Where an abscess ruptures through the skin and rectal wall at two or more points and into an adjacent organ a *complex fistula* (Fig. 241) results. In the majority of cases pus finds an outlet through the skin—*blind external fistula* (Fig. 236, *D*)—or rectum—*blind internal fistula* (Fig. 236, *C*)—or escapes through both skin and the bowel—*complete fistula* (Fig. 235, *A*).

When ischiorectal abscesses attain considerable size pus burrows down along the levator ani to the anal muscles, and usually ruptures into the anal canal in the posterior median line between the sphincters  $\frac{1}{2}$  inch (12.7 mm.) above the anal margin (Fig. 236).

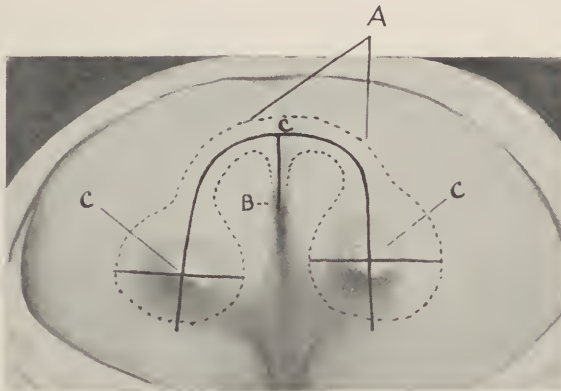


Fig. 223.—Symmetric bilateral ischiorectal abscesses connected by (*A*) horseshoe fistula, an offshoot of which (*B*) entered the rectum posteriorly at the sphincteric juncture; *C*, lines of incision employed in laying open abscesses and dividing fistula (see Fig. 222).

The rectal opening is located here in 95 per cent. of cases, but in rare instances under great pressure or through gangrenous necrosis pus may perforate the rectal wall at any point higher up.

Owing to virulence of the infecting organisms some ischiorectal abscesses are more destructive than others and the patient rapidly becomes dangerously septic. The most alarming infections occurring in the author's practice have followed accidental bowel punctures during operation and incisions made in rectum for the relief of submucous abscesses, stricture, and extraction of foreign bodies where the sphincter was not divided and free drainage provided for.

Occasionally enormous ischiorectal abscesses penetrate the retro- or other perirectal space, dissect the peritoneum upward,

or rupture into the scrotum, bladder, urethra, vagina, or abdominal cavity (Fig. 224).

The infected area may be small or extensive and consist of a single cavity, or be composed of a number of pus pockets, multilocular abscess, and remain isolated or cause submucous (Fig. 233), pelvirectal (Fig. 230, *A*), retrorectal (Fig. 230, *B*), subcutaneous (Fig. 218), or ischiorectal (Fig. 224) abscesses.

*Symptoms.*—Usually ischiorectal abscesses are acute and the inflammatory process is reflected by chilly sensations, aching back and limbs, anorexia, furred tongue, malaise, headache, constipation, high temperature, rapid pulse, and sensations of heat and fulness in and outside the rectum.

When an abscess has formed the patient complains of continuous throbbing pain, sphincteralgia, painful defecation and frequent micturition, with inability to freely empty the bladder. As pus accumulates pain becomes increasingly agonizing and the patient is unable to sleep or remain comfortable in any position. In the beginning there are no external signs of abscess on account of toughness of the skin, but when pus collects and presses outward the integument begins to bulge, is tense, indurated, and glistening, and just before rupture takes place the skin becomes very thin and assumes a purplish hue (Fig. 224).

With such a history and condition, when the patient is suddenly relieved of pain and acute septic manifestations, one is justified in concluding that the abscess has ruptured into the rectum, an adjacent organ, or through the skin, but when suffering is only temporarily alleviated it is due to the escape of pus into the retro- or pelvirectal space, and pain and other symptoms will shortly recur in a more aggravated form.

Some abscesses are filled with gas the result of bacterial activity or escape of intestinal gas into the cavity following rectal perforation induced by an injury, ulcer, or foreign body.

*Diagnosis.*—Ischiorectal abscesses are apparent when fully developed, and present as large or small sensitive reddish or purplish indurated or fluctuating ovoid swellings located in the ischiorectal fossa (Fig. 224).

They originate high and are difficult to diagnose early, but with the above symptoms, and detection of tender indurated area between the ischial tuberosity and rectum through palpating the parts between the thumb and index-finger introduced into the rectum, a diagnosis of ischiorectal abscess is justified.

Sometimes bulging of an abscess is seen through the proctoscope, but the author rarely employs proctoscope or a speculum

for this purpose, because their introduction is very painful and little or no information is gained in the majority of cases.

*Pelvirectal* often point in the fossa (Fig. 230), and have been confused with ischiorectal abscess, but in doubtful cases the history usually elicits the information that the patient has been or is now



Fig. 224.—Enormous perirectal abscess ready to rupture into the rectum and through skin over the ischiorectal fossa.

suffering from sacral, spinal, hip, or pelvic disease responsible for the infection.

*Tubercular ischiorectal abscesses* require weeks or months to form, induce little discomfort, cause slight septic manifestations, and because of these peculiarities the patient's tubercular appearance and frequent lung involvement ought not to be confused with

ordinary or acute ischiorectal abscesses. Again, the discharge from tubercular abscesses is thin, whitish, and contains tubercle bacilli, while pus from other abscesses is thick, yellow, and contains colon bacilli, streptococci, or staphylococci alone or together.

Finally, tubercular sinuses are large, their external and internal openings irregular in shape, and the skin adjacent to the fistulous aperture is thin, bluish, undermined, and droops into the abscess cavity (Fig. 226, B).

*Treatment of Ischiorectal Abscess.*—Aspiration, ice-bag, poultices, and other palliative measures that relieve pain and favor

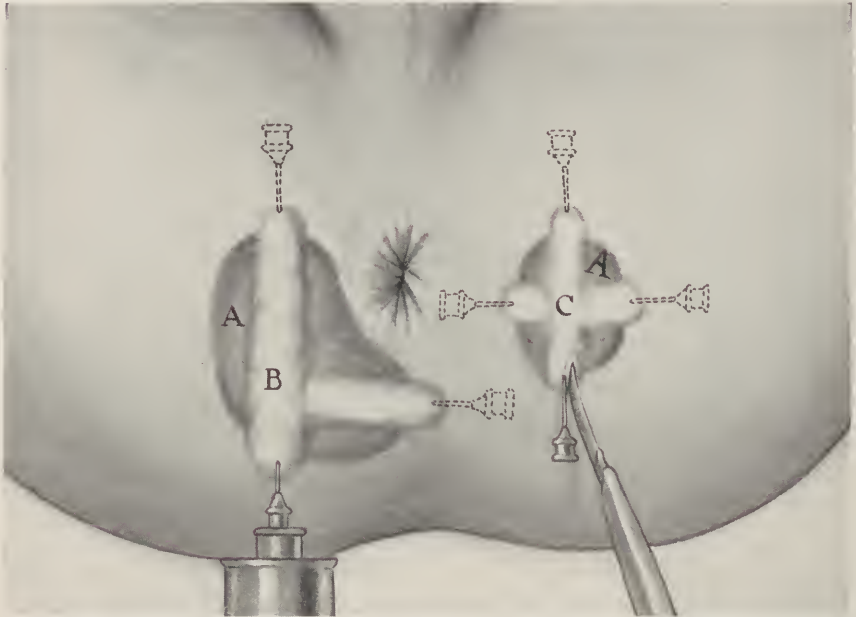


Fig. 225.—Showing direction of needles in local anesthesia operations for anorectal abscesses: A, Abscesses; B and C, appearance of anesthetized areas when abscesses are radically operated by L- or + -shaped incisions.

spontaneous opening of abscesses are contraindicated, for valuable time is lost, infection rapidly extends, causing marked destruction of tissue, unless the abscess is promptly evacuated and necrotic tissue removed.

Puncture and small incisions do not suffice in acute abscesses because they fail to procure free drainage or permit one to remove sloughing tissues through diminutive openings which gradually close, leaving the patient with fistula. Such a cut is justifiable only as a preliminary step to relieve suffering while the patient is being prepared for radical operation.



*Local anesthesia* (Fig. 225) may be employed when small or large, superficial or deep abscesses are opened, but the author prefers gas-ether or gas-oxygen anesthesia when radically operating on extensive ischiorectal abscesses because the preliminary injection of a local anesthetic into tissue surrounding an acutely inflamed abscess induces considerable pain, the abscess is already distended with pus, which makes infiltration difficult and painful, and the operator does not know in advance the extent of or direc-

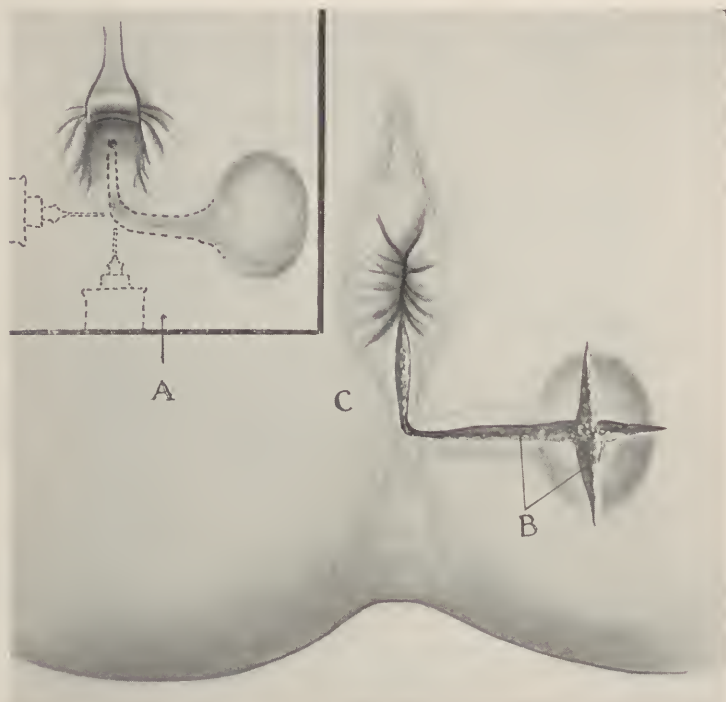


Fig. 226.—Extensive ischiorectal abscess and blind internal fistula: *A*, Abscess discharging into the rectum at the usual site; *B*, cross incision made in opening and draining the abscess cavity; *C*, cut carried into the rectum, dividing the fistula and sphincter previously anesthetized.

tion incisions will take in cases of extensive abscess complicated by fistula.

Surgical treatment is also preferable for abscesses in process of formation because the incision provides drainage and an outlet through which organisms responsible for infection escape.

When operating upon ischiorectal abscesses the author incises the swelling deeply from end to end about 1 inch (2.54 cm.) from the anus, inserts the finger and breaks up necrotic tissue and all

pus pockets—loculi—following which the main abscess cavity is thoroughly cureted to remove broken down *débris*, irrigated, swabbed with carbolic, and drained.

When subcutaneous fat and deeper tissues adjacent to the rectum are undermined or pus has escaped into the bowel a second or rectal incision is carried through the structures and sphincter muscle into the rectum (Fig. 226) to insure complete drainage and forestall fistula; the wound then resembles the letter T (Fig. 226).

Where the abscess is large, extends in different directions, other incisions are made unless very extensive cutting is required, in which case counterdrainage openings are made to avoid unnecessary mutilation of the parts and sphincter.



Fig. 227.—Partially healed extensive wound made when operating on an enormous gangrenous perirectal abscess that involved the ischiorectal fossa, extended from sacrum to upper margin of the scrotum, and dissected the rectum and urethra free.

In aggravated cases where multiple extensive cuts are necessary convalescence is shortened by partially suturing wound edges with catgut provided all necrotic tissue has been removed and the wound is carefully cleansed and treated with carbolic, but the author prefers healing by granulation (Fig. 227), since a cure is more certain and serious secondary infections have followed the suturing of abscess wounds.

Bilateral ischiorectal abscesses (Fig. 223) connected by fistula running anteriorly or posteriorly to the anus are incised, cureted, cleansed, and drained out, following which the fistula is divided. When pus burrows high behind or around the rectum from one ischiorectal abscess to another, complete division of the connecting sinus may be impracticable because it necessitates cutting the sphincteric attachments, controlling nerves and other structures,

which is often followed by drawing of the anus upward or fecal incontinence.

In such cases after operating on abscesses the fistula is partially divided or dilated, cureted, cauterized, and packed with gauze. Thereafter the incisions are cleansed and drained by the daily insertion of narrow gauze strips; later drains are unnecessary and wounds are stimulated with topical applications of ichthyol or silver nitrate (8 per cent.). When pus is abundant and drainage

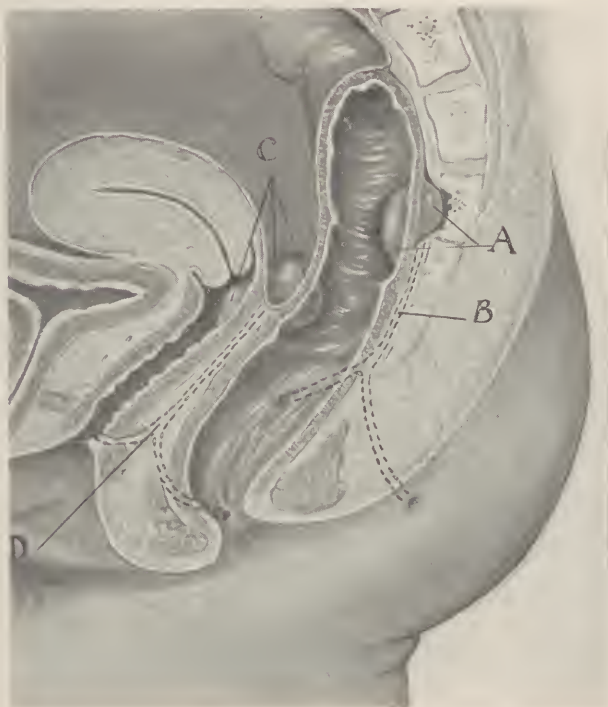


Fig. 228.—Aggravated types of rectal abscess: *A*, Retrorectal abscess; *B*, fistula that discharged high up in the rectum and upon the buttocks caused by necrosed sacrum; *C*, extensive abscess in Douglas' pouch that indented the vaginal and rectal walls inward and found a vent through a fistula having openings near the anus and in the lower vagina.

doubtful the rectum is split in the posterior median line up to the tract crossing it behind, or a counteropening is made to it near the coccygeal tip to provide satisfactory drainage.

When ischiorectal are situated close to or connected by sinuses leading to other anorectal abscesses technic of the operation is varied to meet indications as they arise.

**Retrorectal Abscess.**—These infections (Fig. 228, *A*) are rare, located above the levator ani muscle, and usually caused by

tuberculosis, syphilis, other disease, or injuries resulting in necrosis of the sacrum, coccyx, or ilium, high rectal incisions for stricture, cancer, or submucous abscess, careless introduction of imperfect syringe nozzles, indiscriminate probing of deep sinuses, or the forcible insertion of proctoscopes or bougies which lacerate or rupture the rectum.

Infection in retrorectal (Fig. 230, *B*) is due to the same organisms responsible for ischiorectal abscess, which find their way to this space isolated in the above manner, or through stercoral ulcers situated above a stricture or cancer or burrowing upward of pus from an abscess located in the ischial or perianal region.



Fig. 229.—Appearance of wound immediately following operation for extensive ischiorectal abscess. Note marked thickening of the tissues, deep crevices, and gangrenous sloughs.

*Symptoms.*—The manifestations of retrorectal abscesses are obscure and often confused with bone or other disease responsible for them.

Generally septic indications are less pronounced than in ischiorectal abscess, and pain which comes on gradually is heavy and centered in the back and limbs. These abscesses may rupture into the rectum, ischiorectal space, skin posterior to the anus, or penetrate the musculature only, and lead to the formation of intermural or submucous abscess.

*Treatment.*—The underlying treatment of retro- is the same as for other anorectal abscesses—*free incision, curetage, and drainage*. The cavity is usually reached by a lateral sacrococcygeal



incision, but when this is not feasible, pus is evacuated through a deep semicircular cut made posteriorly midway between the anus and coccygeal tip, from whence dissections are carried upward to the infected area.

Some surgeons employ rubber drainage-tubes, but fistula more often follows than when a gauze drain is employed. Sitting upright and walking facilitates drainage after these operations.

**Superior Pelvirectal Abscess.**—Abscesses of this type (Fig. 230, *A*), having no connection with the rectum in the beginning, are usually secondary to infection of the sacrum, spine, uterus,

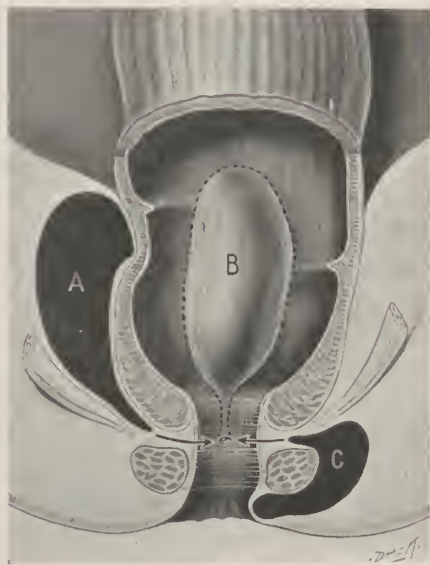


Fig. 230.—Types of anorectal abscess: *A*, Superior pelvirectal abscess; *B*, posterior retrorectal abscess; *C*, ischioirectal abscess. Arrows indicate point at which these abscesses open into the rectum.

tubes, bladder, prostate, urethra, or hip-joint, but have been caused by foreign bodies swallowed or introduced per anum, penetrating injuries, pneumatic rupture of the bowel, high rectal, vesical, and vaginal operations, and careless introduction of bougies, proctoscopes, and enema tubes.

**Symptoms.**—Superior pelvirectal abscesses develop slowly and cause little inconvenience or pain when infection starts in bony structures or abdomen, and the history may point to complicating disease near or distant to the rectum.

When the pelvirectal abscess is tubercular it causes little discomfort, and weeks elapse before considerable pus accumulates,

but where septic organisms—colon bacilli, streptococci, etc.—escape from the perirectal areolar tissue, causing infection, manifestations develop rapidly and are pronounced. The patient has a chill, furred tongue, high fever, rapid pulse, pelvic pain, vesical irritation, constipation, muscular irritability, heavy at first, and then continuous throbbing pain until the abscess is opened or ruptures, occasionally suppression of urine or swollen discolored scrotum, and pus from superior pelvirectal abscesses have simultaneously ruptured into the rectum and adjacent organs or through the perianal skin.

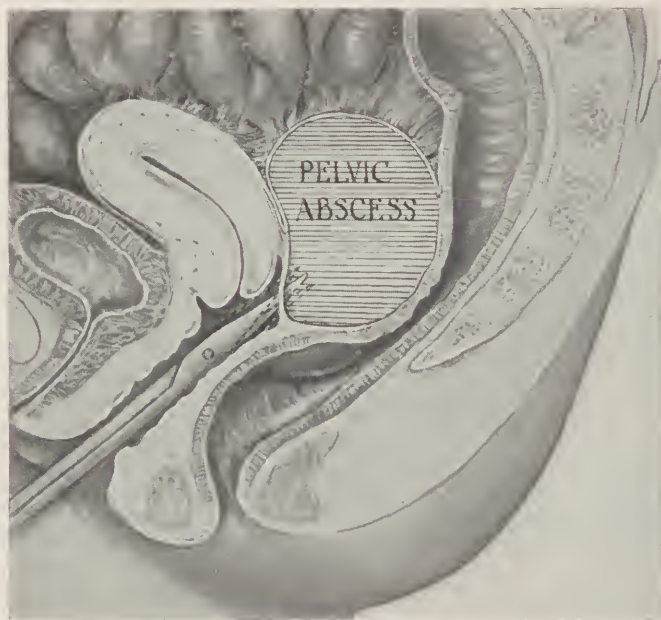


Fig. 231.—Extensive pelvic abscess pressing upon rectum, opened with scissors and drained through the vagina.

*Diagnosis.*—These infections, which are seldom recognized until fully developed, are detected in men by rectal, and women by vaginal, examination. In such cases the finger feels a large sensitive indurated or fluctuating swelling on a level with the upper margin of the prostate anteriorly or at one side of the rectum.

In neglected cases pus encircles the bowel, enters the retrorectal space, or breaks through the levator ani muscle and infects the ischiorectal fossa. When a diagnosis cannot be made in the above manner, inspecting the bowel through a proctoscope and bimanual examination, the surgeon is justified in waiting further develop-

ments unless there is a chance of completing the diagnosis following an exploratory incision.

*Treatment.*—Here as in other anorectal abscesses pus is evacuated and free drainage established. Where an abscess presses against the bowel below the peritoneal attachment relief is quickly obtained by incising rectum and sphincter, irrigating, and packing the cavity with gauze. The incision includes the anal muscle to avoid secondary infection from an otherwise imperfectly drained wound, but is never carried high enough for the bistoury to enter the peritoneal cavity.

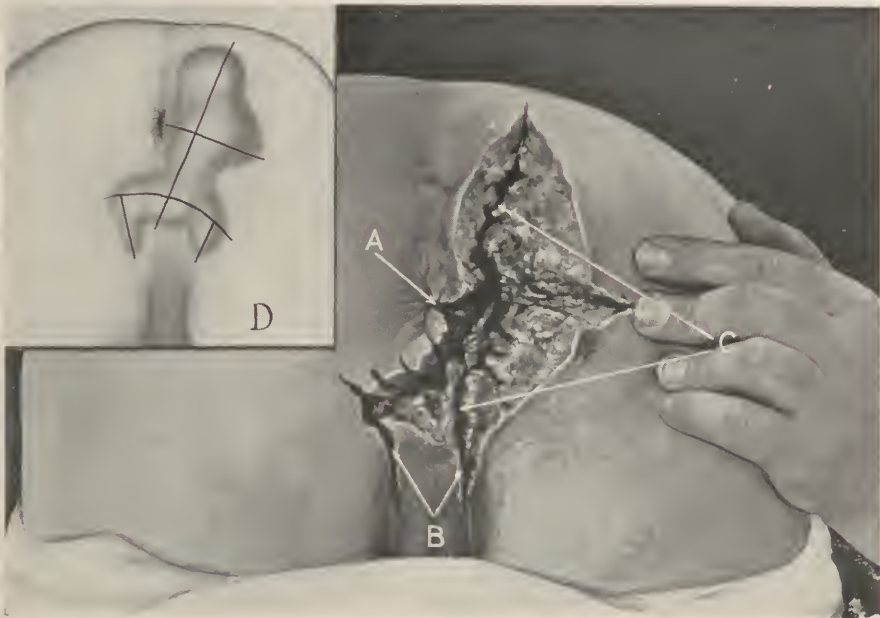


Fig. 232.—Appearance of wound following operation for extensive gangrenous retrorectal and scrotal abscess: *A*, Sphincteric, *B*, scrotal, and *C*, long lateral incisions. Insert, *D*, indicates extent and contour of the abscess and preliminary incisions made in radically operating upon it.

Abscesses in Douglas' pouch are opened with scissors introduced through the vagina (Fig. 231).

Sometimes a wide incision directed through the perineum and upward between the rectum, prostate, and bladder is effective, but occasionally such an opening closes before the discharge ceases, when a second operation is required.

*Aspiration* is impracticable, for punctures made with needle, cannula, or bistoury are objectionable, since large vessels may be injured, the opening is too small for drainage purposes, and the wound becomes infected, leaving a fistula.

On account of the close relation between pelvirectal infection and the peritoneal cavity one must operate cautiously and use great care when making digital and instrumental examination, otherwise the abscess may be ruptured and cause peritonitis.

Two of the author's cases of pelvirectal abscesses were successfully drained through a vaginal incision (Fig. 231).

**Submucous—Intermural—Abscess.**—In this type of infection pus accumulates between the mucous membrane and muscular tunics of the rectum (Fig. 218, *A'*). Intermural abscesses are rare, which is surprising, since the mucosa is frequently traumatized, penetrated by foreign bodies, perforated by ulcers, and the site of unhealed wounds, conditions favoring the escape of septic material and organisms into the submucosa.

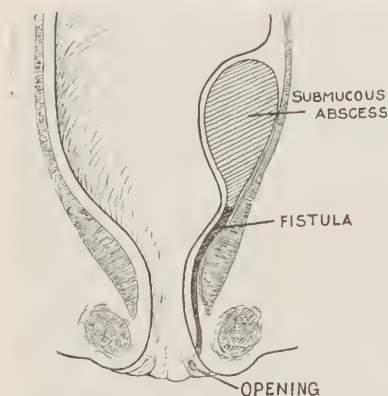


Fig. 233.—Submucous abscess discharging into the anal canal at the mucocutaneous juncture—usual site.

Intermural abscesses of the anal canal are small, but in the rectum (Fig. 233) proper vary from olive to orange size. They are not sensitive, and when of considerable size cause but little suffering, owing to lack of tension, since the mucosa gives way proportionately as pus forms, and sensory nerves are not abundant in the rectum.

Submucous abscesses usually rupture high in the rectum or near the anus, but in exceptional instances they perforate the bowel at the sphincteric juncture and lead to the formation of marginal or ischiorectal abscess and fistula.

On three occasions the author has observed gangrenous sloughs in connection with intermural abscesses: in one a small area of the mucosa was destroyed; in another the entire mucous membrane of the lower 3 inches (7.62 cm.) of the rectum became gangrenous, and in the third all rectal coats and the sphincter sloughed away, which was followed by rectal retraction, stricture, and fecal incontinence.

**Symptoms.**—The manifestations of submucous are less pronounced than those of ischiorectal abscess; the patient usually complains of loss of appetite, slight rise in temperature, and gradually increasing discomfort in the rectum, with sensation of weight and fulness, but does not complain of agonizing, throbbing pain.

**Diagnosis.**—Intermural abscess is suspected when the above



symptoms are complained of, but when fully developed they are detected by digital examination as a non-sensitive, fluctuating, boggy swelling, and can be seen bulging into the rectum when inspected through a proctoscope.

*Treatment.*—Palliative measures being useless, an operation is performed immediately. Some surgeons simply open these abscesses, but to prevent subsequent infection the author freely incises them, removes overhanging edges of mucosa, and carries the incision downward through the anal canal sphincter so that one end of the drain may be placed in the abscess cavity and the other brought through the skin cut, a procedure that insures effective drainage. Cross-incisions are dangerous here because large hemorrhoidal arteries and veins may be severed and pockets are left in which feces collect.

**Tubercular abscesses** may result from infection caused by human or bovine tubercle bacilli, and 80 per cent. of cases are secondary to tubercular foci elsewhere—the lungs, intestine, spine, or hip-joint—and are difficult to heal, owing to the patient's lowered vitality. Pus from sacral, spinal, or hip-joint tubercular lesions usually points in the ischiorectal fossa, while primary and secondary tubercular abscesses originating in the anorectal region are smaller—vary from olive to hen's egg size—and make an outlet near the anal margin.

Patients thus afflicted look tubercular, are emaciated, and infection of the anorectal region is usually preceded by pulmonary hemorrhage.

*Symptoms.*—Tubercular abscesses take weeks or months in *forming*, during which time the patient runs a temperature, has a furred tongue, looks very ill, suffers little discomfort other than uneasy sensations in vicinity of the rectum. When opened or ruptured they discharge an abundant whitish secretion sometimes containing tubercle bacilli and the skin about the fistulous opening is thin, of a bluish hue, droops inward, and when a complete fistula forms it is large and possesses an irregular-shaped opening at either extremity.

*Diagnosis.*—In this class of cases diagnosis is based on the symptoms, duration, location, and appearance of the abscess, thin rice-water-like discharge in which tubercle bacilli may be found that resemble and have been mistaken for smegma bacilli, and submitting the patient to tuberculin tests.

*Treatment.*—The author does not waste time with poultices and other palliative measures, but promptly incises tubercular abscesses, freely making counter incisions when necessary. (Fig.

226), after which drooping skin edges are removed and the abscess cavity is thoroughly irrigated and *cauterized* to close lymph-channels and prevent spreading of the infection (Fig. 286, A).

Multilocular tubercular abscesses are rare and necrotic tissue is seldom observed, and because of this the curet is seldom used in these cases.

Local anesthesia is employed except where infection is very extensive, ether being objectionable, since it aggravates tubercular foci in the lungs, a usual complication in anorectal tubercular abscesses and fistulæ.

The author does not keep tubercular patients in the hospital more than a day or two, prescribes a liberal diet of easily digested food, requires them to sleep in a well-ventilated room with windows wide open, spend their time in the fresh air, and administers tonics to improve their general health.

Abscess wounds in patients having pulmonary tuberculosis never do well when the sufferer is kept in bed, and wounds stop healing and incontinence often ensues when they are frequently cauterized or tightly packed instead of being loosely drained.

In subjects whose vitality is low and healing could not be expected to take place the abscess is not radically operated, but opened, drained, and irrigated daily, and the patient is sent to the mountains to recuperate, leaving the abscess cavity or resultant fistula to be cured later.

**Interstitial Abscess.**—Occasionally infection occurs in muscular or cellular structures of the buttocks distant to the rectum, and so-called interstitial abscesses form that resemble perianal and ischiorectal abscesses, and since their symptomatology and treatment do not materially differ from other perianal abscesses they do not require further consideration.

**Diphtheric Abscess.**—True diphtheria of the bowel is rare, but the author has been fortunate in seeing 2 cases: in one the rectum sloughed extensively, and in the other the bowel was ulcerated, and the baby also suffered from an abscess near the anal margin.

**Bartholin's Gland Abscess.**—Bartholin's gland frequently becomes infected on one or both sides, and single or double abscesses form (Fig. 217), accompanied by the usual septic manifestations. The swellings cause sharp pain in the labia, and when neglected pus ruptures through overlying skin or burrows downward beneath the labial integument and discharges into the rectum through an opening located in the anterior median line  $\frac{1}{2}$  inch (12.7 mm.) above the anus (Fig. 217). Because of its location there is no

excuse for mistaking an abscess involving Bartholin's gland for other anorectal infection.

*Treatment.*—The treatment of these abscesses is simple and consists in freely incising and cleaning out both gland and abscess with knife, scissors, cautery, or curet; for when every vestige of an infected Bartholin gland is not extirpated recurrence is certain. Pus from it may burrow in any direction beneath mucosa and skin of the labia or vagina; and it may enter the rectum in the anterior median line a short distance above the anus, pass around the rectum in the subcutaneous fat, or descend, encircle the anus, and perforate the rectum in the posterior median line between the sphincters.

Bartholin's gland abscesses constantly recur when connected with fistula, and it is essential that all sinuses be divided when the abscess is operated on. Occasionally the author has succeeded in curing this obstinate type of infection by incising and cauterizing the gland with carbolic acid or cautery point.

**Phlegmonous — Gangrenous — Abscess.**—Gangrenous (Fig. 232) may be primary or secondary to other abscesses, usually occur in robust individuals, and are often traceable to penetrating injuries, perforating ulcers, or to operation for rectal cancer, stricture, or other lesion where the bowel is inflamed, and feces, foul discharges, or gas escapes into the loose areola tissue.

In 3 of the author's 12 cases of phlegmonous abscess infection was attributed to gonorrhea; 2 of these patients admitted being passive pederasts and in that manner having contracted rectal gonorrhea, and in the other case the diagnosis was based on finding gonococci in the stools and discharge. In some instances abscesses contained gas and infection was probably caused by gas bacilli, but in others streptococci, staphylococci, and colon bacilli were the dominating organisms; tubercle bacilli were not found in the stools or discharges.

Gangrenous abscess is common in Peru, Brazil, Portugal, and Africa, influenced probably by the climate, soil, or mode of living in these countries; and in the States they have also been associated with diabetes, glycosuria, arteriosclerosis, sepsis, and infectious ulceration of the rectum.

Phlegmonous proctitis and periproctitis seldom attack women, and are usually encountered in fat men who lead a sedentary life, gourmandize, or have a pale complexion. Very little is known concerning the *etiology* and *pathology* of phlegmonous infections, which have occurred independently, been associated with gonorrheal, tubercular, entamebic, and bacillary coloproctitis, diph-



theria, and pneumonia, and have suddenly appeared without apparent cause.

Gangrenous periproctitis originates and extends slowly in some and rapidly in other cases, a destructive necrosis that destroys soft and leaves dense fibrous tissue hanging in strings.

On several occasions the author has seen one or both buttocks extensively involved, the rectum being dissected free from skin and muscles and drawn upward for 1 inch (2.54 cm.) or more. In most of the author's cases the necrotic process started in the ischial region, extended in all directions, and in 3 instances both buttocks were almost completely destroyed. In neglected cases overlying skin is thin, of a bluish hue—like that seen in an undermined tubercular fistula—and when the abscess is incised a dark greenish fluid and black offensive tissue sloughs escape through the opening. In some cases necrotic tissue was very extensive, but easily removed with the fingers or forceps after overlying unhealthy skin had been removed.

The author has observed phlegmonous cellulitis originate in a submucous abscess and extend upward and downward destroying the mucous membrane, rectal wall, and sphincters, but usually the destructive process originates beneath the perianal skin and works upward into and around the rectum or urethra and outward, extensively involving the buttocks.

When a gangrenous abscess containing gas is compressed *crepitus* or a sensation similar to that obtained from squeezing an air-filled lung is felt. Phlegmonous proctitis and periproctitis may terminate fatally through sepsis, peritoneal involvement, toxemia, or exhaustion.

Incontinence, stricture, recto-urethral fistula, and distortion of the anorectal region by scar tissue are the most common sequelæ of healed gangrenous abscesses.

*Symptoms.*—In the author's most serious cases the patient suffered slightly, and destruction of tissues was entirely out of proportion to accompanying symptoms—furred tongue, slight temperature, weak pulse, and slight discomfort in the anorectal region. In a few instances sepsis was virulent, as evidenced by a high temperature, dry red tongue, fast pulse, chill, and greenish-yellow hue of the skin.

*Diagnosis.*—Phlegmonous abscesses are seldom diagnosed before they are incised, when they are recognized by contained putrid sloughs, greenish fluid, and absence of thick yellow pus found in other abscesses.

*Treatment.*—Overlying skin is freely incised and removed,



after which necrotic and gangrenous tissue is removed with seissors, curet, and hot saline irrigation; knife and curet being handled cautiously to avoid injuring vessels dissected from their surroundings by the gangrenous process. Formerly multiple incisions were made and drainage-tubes inserted, but integument between cuts frequently sloughed away, and because of this the author has in recent cases excised undermined skin freely, leaving large open wounds that granulate rapidly.

Hot boric irrigations and fomentations are used to soothe and keep the wound clean for a few days, but when necrotic tissue is slow in coming away it is trimmed off or destroyed with calomel; as soon as the wound assumes a healthy look it is drained with gauze, and is not stimulated or cauterized except when healing is sluggish or exuberant granulations appear.

**Diffuse Septic Abscess.**—When periproctitis is exceedingly virulent the infection is sometimes designated as *diffuse septic abscess*, and in such cases symptoms resemble those of puerperal sepsis. The condition is usually secondary to rectal incisions, punctures, or ulcerative lesions that permit the passages of septic organisms deeply into areolar tissue of the ischiorectal fossa or pelvic space.

Diffuse septic abscesses remain localized, extend around the rectum, involve the peritoneum, leading to the accumulation of a small or an enormous amount of pus or occasionally cause extensive sloughing.

*Symptoms.*—Two or three days following infection the patient complains of chilly sensations, headache, malaise, temperature, rapid pulse, pain in the pelvis, discomfort during defecation, and profuse perspiration, nausea, vomiting and abdominal distention, and tenderness—when peritoneum is involved; later, as pus accumulates, pain and distention increase, the patient is anxious, constantly draws the limbs upward, gets weak, has a septic appearance, and occasionally suffers from diarrhea or erysipelas.

When the rectal wall is diseased the mucous membrane appears inflamed, sensitive and edematous, and involved skin is red, glistening, and painful, or black from necrosis, and sloughs at one or several points. Urinary complications are troublesome and occasionally endocarditis or pericarditis develops.

In a neglected case of retrorectal diffuse septic abscess treated by the author the patient developed facial erysipelas, phlebitis, joint infection, and several ordinary abscesses distributed over the thighs.

## PROGNOSIS

Ordinary never terminate fatally, but chronic neglected diffuse and phlegmonous perirectal abscesses have caused death.

The author has operated on more than 1000 abscesses with only 1 death, and this patient, who was in the last stages of diabetes, died in a state of coma three days following an operation for gangrenous ischiorectal abscess.

The prognosis is good when an abscess is radically operated on and the wound is intelligently treated, but when a large abscess is simply punctured or slightly incised and imperfectly drained infection extends or recurs to cause much unnecessary suffering and leave the patient with a fistula.

Tubercular always require a longer time to heal than ordinary abscesses, and when the patient is emaciated, exhausted, and greatly devitalized by pulmonary tuberculosis a cure is always difficult or impossible.

## Chapter XVIII

### Anorectal Fistula

#### DEFINITION, HISTORY, ETIOPATHOLOGY, CLASSIFICATION

THE term *fistula* is derived from the Latin word *fistula*, meaning reed or pipe, so-called because of the straight tube-like channel through which gas or air passes; a misleading description because the tract is not always straight nor does gas often escape through it.

**Definition.**—Typical fistula in ano may be defined as a sinus having two openings, one in the perianal skin and the other in the rectum (Fig. 234), but it is impossible to give a definition that would comprehensively describe different types of fistula. Sinuses opening high are called *rectal*, and those entering the bowel low down are designated *anal* fistulæ.

**Historic Note.**—From the time of Hippocrates and Celsus little was written relative to anorectal affections because they were seldom healed, and incurable diseases were considered disgraceful, and because of this patients thus afflicted rarely applied for treatment.

Hume, in relating the death of Henry V, King of England (1422), says the king was seized with fistula, which surgeons of the time had not the skill to cure. Shakespeare immortalized fistula in his play "All's Well that Ends Well," and Astruc (1728) states that no man in Rome ever complained of fistula until the Emperor Tiberius Cæsar was attacked by it. The disease was seldom observed in France until Louis XIV suffered from it.

King Louis, having submitted to all sorts of cures, was operated on by Monsieur Felix, who performed on him the first successful division operation for fistula, and the king paid him and his assistants \$73,500 for the work.

Anorectal sinuses are frequently encountered in clinic and private practice, and from one-third to one-fourth of all patients seeking relief from affections of the anus and rectum suffer from fistula.

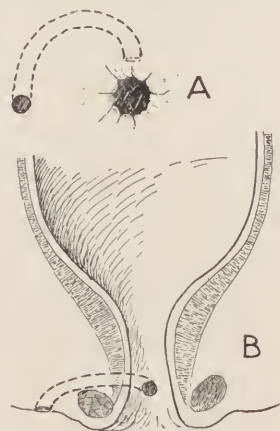


Fig. 234.—A, Complete internal; B, complete fistula.

Experienced proctologists seldom fail to cure fistula at the first attempt, but general surgeons and family physicians are not so successful.

Statistics of our best hospitals apparently show that not more than 50 per cent. of fistula patients are discharged cured.

The author frequently sees patients operated on for fistula from two to ten times without being cured, many of whom suffer from partial or complete incontinence.

Fistula, which usually results from abscess and rarely heals spontaneously, has been encountered in different races, countries, both sexes, and at all ages.

**Sex.**—In the author's practice fistula in ano has been encountered in men four times more frequently than women. Men are more often afflicted with abscess and fistula because their occupations are more arduous and expose them to inclement weather, and they are frequently sufferers from proctitis and periproctitis.

**Age.**—The author has operated on patients for fistula whose ages varied from three days to eighty years, but the condition is usually encountered in persons varying in age from twenty-five to forty-five years, or during the active periods of life. He has operated 40 times on infants, children, boys, girls, and young adults suffering from fistula whose ages varied from one day to twenty-one years:

INFANTS	
Three days.....	1
Three weeks.....	1
Six weeks.....	1
Two months.....	1
Four months.....	1
Six months.....	1
} ... 6	
CHILDREN	
Seven months.....	1
Nine months.....	1
Ten months.....	1
One year.....	1
Three years.....	2
Four years.....	1
Six years.....	2
Eight years.....	1
Nine years.....	1
Ten years.....	1
Eleven years.....	2
Twelve years.....	1
} ... 15	
BOYS, GIRLS, AND YOUNG ADULTS	
Twelve years.....	2
Fourteen years.....	1
Fifteen years.....	2
Sixteen years.....	1
Eighteen years.....	3
Nineteen years.....	2
Twenty years.....	3
Twenty-one years.....	5
} ... 19	
Total.....	40

The author was unable to trace the causation of fistula in infants except in 2 instances, where it was due to congenital syphilitic ulcers. In older children abscess and fistula resulted from foreign bodies lodged in the anal canal, thread-worms, catarrhal and



specific ulcerative coloproctitis, where infective material escaped through an ulcer, and fissure or sloughing, thrombotic hemorrhoids, or unknown causes.

#### ETIOPATHOLOGY

In probably 95 per cent. of cases anorectal fistula is the remains of an *abscess*, and any one of the causes of *periproctitis* discussed in Chapter XII may be responsible for fistula in ano. An abscess that ruptures or has been punctured to evacuate pus rarely heals spontaneously, but contracts, to form a sinus.

There are several reasons why abscesses do not completely heal spontaneously: (a) the inflamed area obtains little rest because of defecation, micturition, and activity of the sphincters, levator ani, and other muscles in close relation with the rectum, (b) perirectal areolar tissue offers little resistance and pus burrows in any direction, (c) gas and feces sometimes escape into and reinfect the abscess cavity, (d) imperfect drainage where the ruptured opening or incision is too small, and (e) the infection may be due to tuberculosis.

Fistulæ are sometimes induced by syphilitic, tubercular, malignant, gonorrheal, bacillary, entamebic, and other types of ulcers that perforate the mucosa or penetrate the rectal wall, or foreign bodies that lodge in or perforate rectal tunics. Careless and indiscriminate probing of fissures, ulcers, and wounds is a pernicious practice and often leads to infection and fistula. The author has treated 5 patients who suffered from long sinuses caused by probing of so-called mucous channels.

Blind internal fistulæ (Fig. 237) located in the anterior median line may result from unhealed fissure, submucous or subcutaneous abscess, and sinuses secondary to inflamed crypts, diverticula, ulcers, stricture, hemorrhoids, and malignant disease have been observed by the author.

Gunshot, bayonet, and stab wounds, falling upon sticks and other pointed objects have induced fistula in ano, and in 3 of the author's cases sinuses were caused by careless introduction of imperfect enema syringe nozzles, and in another of his patients a pointed glass enema tube was forced through the rectum and broken off.

Rectal and sacral dermoids and necrosis of the coccyx and sacrum have at times been associated with fistula where evidence of previous abscess could not be obtained.

Years ago when the injection of hemorrhoids with carbolic

acid was popular the author treated several blind and complete fistulæ caused by sloughing or abscess resulting from the treatment.

Constitutional and specific diseases, typhoid and scarlet fever, Bright's disease, diabetes, and joint infections are said to have caused fistula, but the author does not understand how this occurs, except they predispose the patient to abscess or cause ulcers that perforate the rectum and permit septic organisms to enter adjacent areolar tissue.

Anorectal tubercular ulcers may induce fistula through direct extension of the inflammatory process, or acting as pockets in which septic organisms lodge and cause infection and abscess, pus from which contain tubercle or colon bacilli, streptococci, or staphylococci alone or admixed.

The author detected thread-worms in a blind internal fistula, but was unable to determine whether or not they caused it. Few fistulæ are tubercular, irrespective of the teachings of physicians and surgeons who maintain that tuberculosis is a common cause of anorectal fistula.

#### CLASSIFICATION

There is no way of classifying fistula that would meet indications from all viewpoints, for they may be: (a) *acute* or *chronic*, (b) *superficial* or *deep*, (c) *simple* or *complex*, (d) *anal* or *rectal*, (e) *complete* or *incomplete*—*blind*, (f) *ordinary* or *tubercular*, and (g) be connected with *adjacent structures* or *neighboring organs*.

**Varieties.**—Surgically considered the following are the chief types of anorectal fistulæ which, for the convenience of study, have been grouped under two headings:

##### *Ordinary Types.*

Complete.  
Blind internal.  
Blind external.  
Complete internal.  
Complete external.  
Horseshoe.  
Complex.  
Complicated.

##### *Special Types.*

Rectovaginal.  
Rectovulvar.  
Rectovesical.  
Recto-urethral.  
Perineal.  
Rectosacral.  
Rectococcygeal.  
Bartholin's gland.  
Submucous.

**Ordinary Types of Fistula.**—The more frequent varieties of fistula which possess many points in common have been discussed under the same headings, while *special types* of fistula connected with other organs have received separate consideration in a chapter set apart for the purpose.

**Complete Fistula.**—This variety of fistula has two openings, one in the skin, near or distant to the anus (Figs. 234–236), and

the other located in the posterior median line of the rectum  $\frac{1}{2}$  inch (12.7 mm.) above the anus at the sphincteric juncture (Fig. 236). *Complete* is encountered more frequently than all other types of fistula, and may be *simple*, as indicated, or *complex* (Fig. 239), where the sinus branches several times and multiple openings form, but usually there is a single tract, and the internal is situated

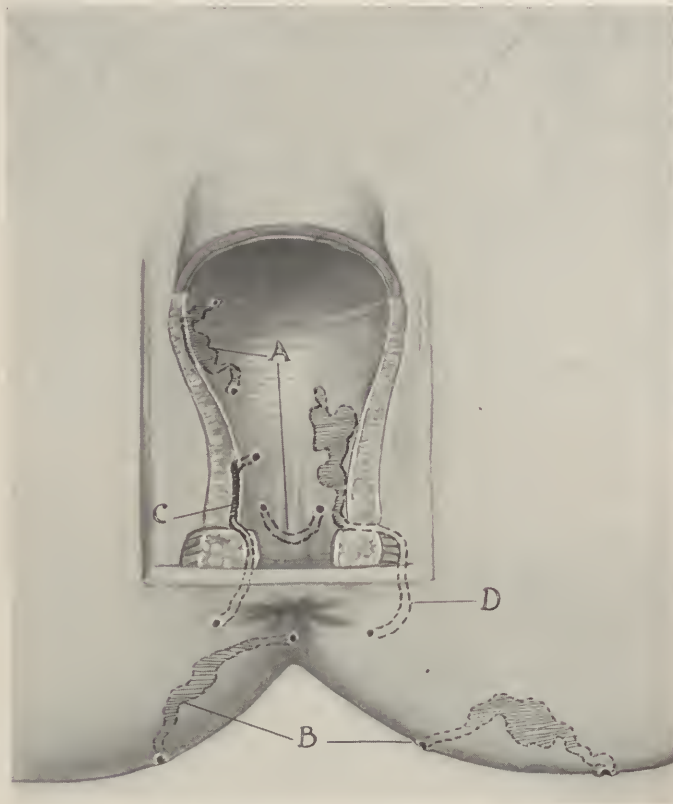


Fig. 235.—Varieties of anorectal fistulæ: *A*, Complete submucous internal; *B*, complete subcutaneous external; *C*, complete; *D*, blind external.

opposite the external opening, which is ordinarily located about 2 inches (5.08 cm.) to the right, left, or behind the anus.

Complete fistulæ may be short or long and are the remains of perianal, ischiorectal, or retrorectal abscesses except when infection starts in an ulcer, fissure, Bartholin's gland, or wound caused by an injury, foreign body, or operation. Except where the rectum is involved by ulcerative proctitis, stricture, cancer, or sacral disease the internal opening is seldom above the sphincter.

**Blind internal fistula** (Fig. 236) has an opening in the mucosa of the anal canal and none in the skin, is usually caused by fissure in ano, ulcers, thrombotic hemorrhoids, foreign bodies, cryptitis, or marginal abscesses, and the opening is situated in the ventral line posteriorly, where the sphincters join. From this point the sinus may travel a straight or irregular course around or up the bowel, beneath the mucosa, but more often a blind fistula descends

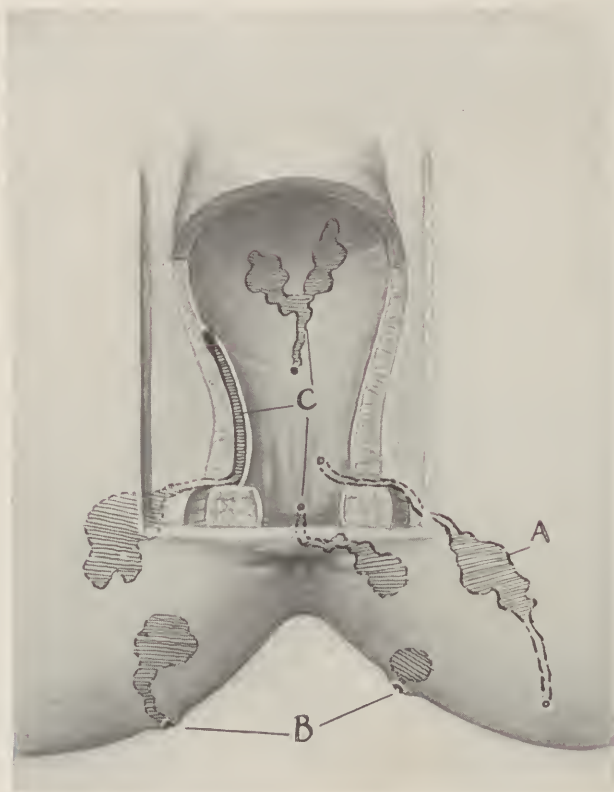


Fig. 236.—Types of anorectal fistula: A, Complete; B, blind external; C, blind internal.

beneath mucosa and skin, where it is felt as an indurated swelling near the anal margin. Occasionally the tract perforates all rectal tunics, and in such cases abscess responsible for the sinus originates in the submucosa or perirectal structures. Pus from blind internal fistula varies, being slight and thin in some, and thick, abundant, and yellow in other sinuses.

**Blind external fistula** (Fig. 236) is marked by an opening in the perianal skin through which pus escapes, and is superficial



when the result of follicular, and deep when caused by ischio-rectal, abscess. The sinus may track toward or away from the rectum, and is variable in size and difficult to probe because of its irregular course.



Fig. 237.—Radiograph showing barium paste deposits in case of horseshoe fistula operated by the author.

When reinfection takes place or the fistula gets blocked, pus may rupture into the rectum, forming complete fistula. Occasionally blind external sinuses are the remains of complete fistulæ where their rectal ends have closed.



Fig. 238.—Probes inserted to show extent of a complex horseshoe fistula with multiple openings in the rectum and perianal skin.

The author has encountered multiple blind internal fistulæ, external tracts, and openings, and treated cases where two or more sinuses discharge through a single outlet.

Blind internal are more common than blind external fistulæ and are frequently mistaken for other anal affections, when the anal skin and mucosa are excoriated by the discharge and the sphincter is irritable.

Blind external are obvious and recognized by the opening in the skin, but blind internal fistulæ are not so easily diagnosed,

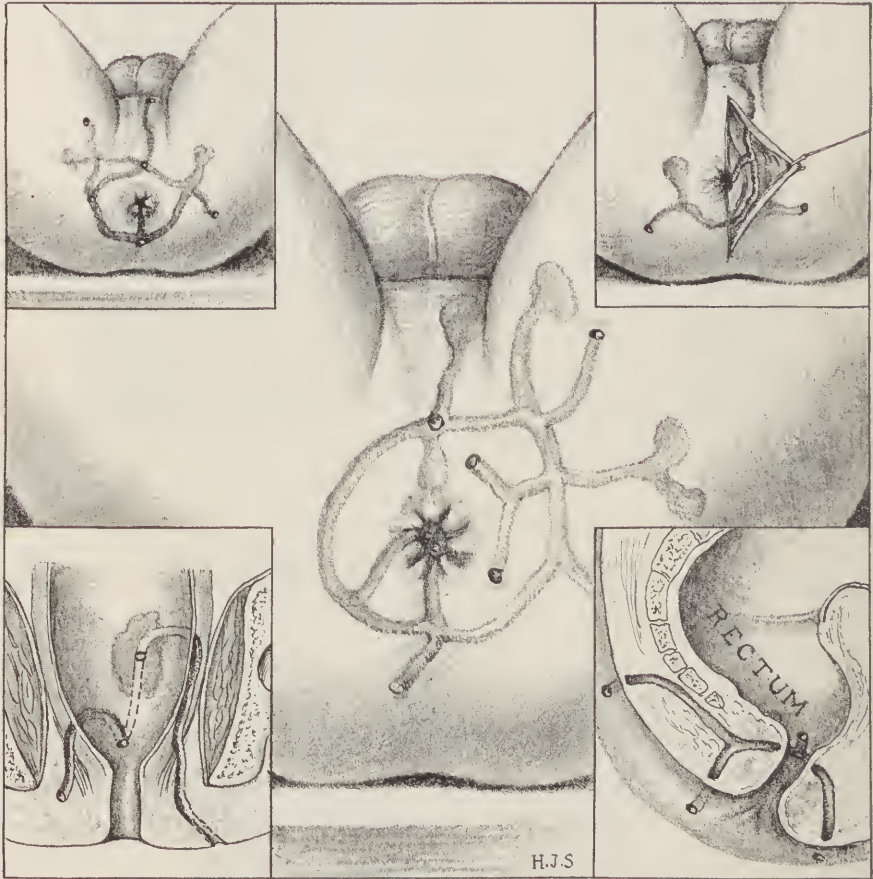


Fig. 239.—Different types of *horseshoe* and *complex* fistulæ having multiple openings in the rectum, buttocks, thighs, scrotum, and perineum, several of which are connected with abscesses.

which is accompanied by stripping pus from the tract with the finger, locating the opening by digital examination, probing sinuses through a speculum or slanting anoscope (Fig. 71), and locating the indurated fistulous tracts beneath skin or mucosa by palpation.

**Complete internal fistula** (Fig. 235) has two openings, both



Fig. 240.—Extensive partially healed horseshoe fistula wound. In this case there were seven external and one internal opening at the usual site. The sinus opening into the bowel was divided following incision of other fistulæ which were made to communicate with it; this obviated severing the sphincter more than once.

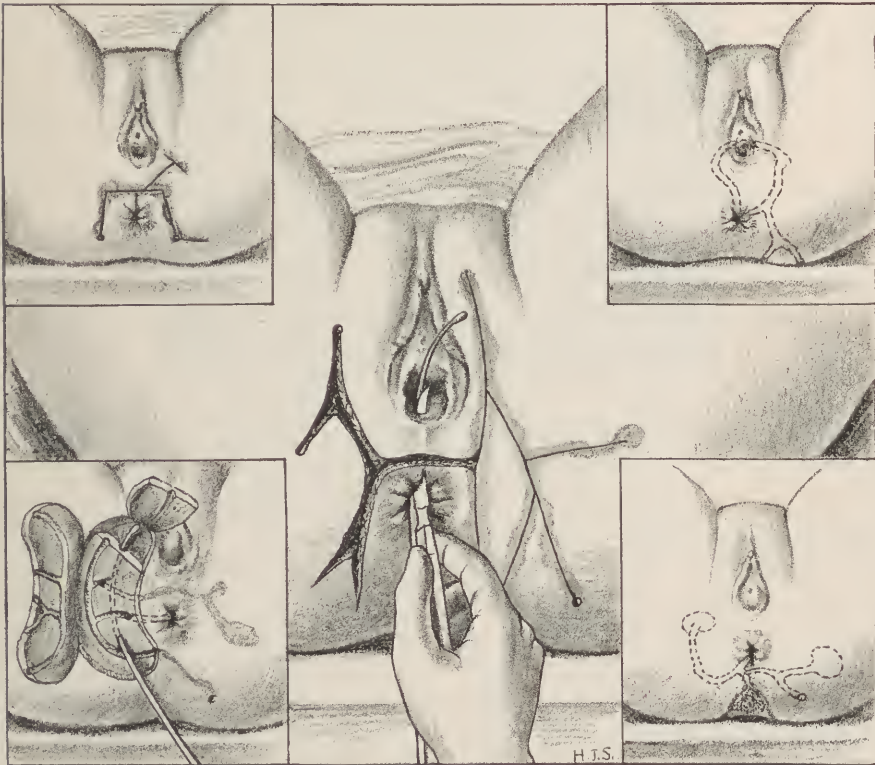


Fig. 241.—Varieties of *complex* and *horseshoe* fistulæ and types of multiple incisions required in some cases. The insert in the lower left corner gives an idea of the author's case of complex fistula (Fig. 242) where sinuses located on different levels (tiers) communicated with each other and abscess and fistulous opening on the opposite buttocks.

in the rectal mucosa, a short or considerable distance apart. The track usually courses through the submucosa and is secondary to abscess resulting from perforating ulcers or a foreign body that has penetrated the mucosa. When the mucous membrane is edematous or thickened and openings are from 1 to 3 inches (2.54–7.62 cm.) apart a partially healed *submucous abscess* is suspected.

Complete are accompanied by about the same manifestations as blind internal fistulæ, except the discharge from them is regular, more abundant, and not so thick and yellow.

**Complete external fistula** (Fig. 235) also possesses two openings, both in the skin. These sinuses are rare, and since the etiology



Fig. 242.—Appearance of wounds three weeks after operation for complex multiple fistulæ and extensive burrowing with forty-eight fistulous openings—thirty-seven upon the buttocks, five in the labia, three in the rectum, and three in the vagina (author's case).

and symptoms do not differ materially from those of blind external fistula, their further consideration is unnecessary.

**Horseshoe Fistula.**—This type of fistula is so named because it passes around the rectum in semicircular fashion (Figs. 239, 240). In the simple type of horseshoe fistula there are three openings: one in the skin on either side of the anus, and the other located in the posterior median line a short distance above the anus at the sphincteric juncture (Fig. 237).

In complicated cases there are multiple openings in the bowel, buttocks, and sometimes neighboring organs, and the main tract may branch in many directions. The author operated on a woman in whom thirty-two sinuses and forty-five external and three internal



openings were encountered, whose buttocks looked as if a load of buckshot had been discharged into them.

*Horseshoe fistula* is confusing from an operative viewpoint, since the tract, its branches, and openings vary widely in different cases. The simplest type is where the sinus travels anteriorly or posteriorly around the rectum from one opening to the other in the subcutaneous fat. Horseshoe fistulae, caused by retro- and



Fig. 243.—Complex fistula. Superior pelvirectal horseshoe sinus with three openings caused by syphilitic necrosis of the sacrum.

pelvirectal abscesses that encircle the rectum high up, usually enter the bowel above the anal canal, penetrating fascia, musculature, and mucosa, and the skin at a considerable distance from the anus, are difficult to diagnose and treat. These deep burrowing and superficial tracts that branch in several directions may be induced by extensive unilateral or bilateral abscesses (Fig. 222) originating in the ischio-, retro-, or pelvirectal spaces or beneath the integument near or distant to the anus.

Primary tubercular horseshoe fistulæ are rare and usually secondary to tuberculosis of the sacrum, hip-joint, spine, kidney, or lungs.

**Complex Fistula.**—Nearly all fistulæ are simple in the beginning, but when neglected in debilitated and tubercular subjects may become complex, branching and rebranching, forming numerous sinuses in the buttocks on the same or different levels that discharge pus through multiple openings located in the skin, rectum, and neighboring organs (Figs. 241–244).

Complex fistulæ may be superficial or deep, and burrow laterally across the perineum, upward to the scrotum and groin, backward to the sacrococcygeal region, to connect with sinuses on the



Fig. 244.—Complicated—complex—rectosacral fistula induced by dermoid cyst of the sacrum.

other side of the rectum, or that discharge into the urethra, bladder, or vagina. Usually there is only one internal opening located at the usual site, but sometimes multiple openings are observed in the rectum.

The author has treated complex fistulæ that extended up the back, clear across the buttocks, well down the thighs, and forward and up to the inguinal region:

**Complicated Fistula.**—When a sinus of the anorectal region is connected with or caused by bone necrosis or disease in the sacrum, spine, hip-joint, pelvic organs, or discharges into the bladder, urethra, vagina, or sigmoid flexure it is designated “complicated fistula” (Fig. 244).

## Chapter XIX

### Anorectal Fistula (*Continued*)

#### SYMPTOMS, DIAGNOSIS, PROGNOSIS

**Symptoms.**—The manifestations of *abscess* which usually precede those of fistula in ano, and cause more acute suffering and constitutional disturbances, named in the order of their appearance, are: *itching, burning sensations in or near the rectum, slight or severe chill, loss of appetite, furred tongue, moderate or high temperature, fast pulse, and finally, constant agonizing, throbbing pain, constipation, difficult micturition, tenderness on pressure, and bulging, reddened, glistening skin over the infected area.*

These manifestations increase in severity until the abscess ruptures or is operated on, which brings immediate relief upon the evacuation of thick yellow, foul-smelling pus. Subsequently the patient suffers very little unless drainage is imperfect and discharge accumulates and again distends the abscess cavity or sinus draining it. When an abscess fails to heal the cavity continues to secrete pus which is discharged through a fistula.

**Discharge.**—The characteristic manifestation of typical fistula is the discharge of pus through outlets in the mucosa, skin, or both. In *recent* and *reinfectd* the discharge is constant, thick, and yellow, but in *chronic* fistula it is slight, thin, watery, of a whitish hue, and may cease for long or short intervals.

The amount of pus discharged depends on the acuteness of the infection, size, number, and length of sinuses and their branches, and whether or not tracts are blocked and the discharge has accumulated. Imperfect drainage from partial or complete closure of tract or outlet is followed immediately by increased temperature, acute pain, swelling, and evacuation of pus through the old or a new opening.

Pus from a tubercular fistula is thin, rice colored, not copious, and rarely excoriates skin or mucosa. Painful attacks seldom complicate this type of fistula because openings at either extremity are large, and free drainage takes place.

*Pain, tenderness, and sphincteralgia* are not troublesome except in *acute* and blind internal fistula and when sinuses are obstructed.

*Excoriation* of perianal skin induced by the acrid discharge is frequent, and causes annoying itching and discomfort when the patient walks or rides.

*Flatus* or *feces* may escape through the sinus when the internal opening is large, as in *tubercular*, but rarely occurs in *ordinary* fistula when openings at both ends are small.

*Induration* is felt about old and subacute sinuses, but is not always demonstrable in recent fistula.

*Sphincteric hypertrophy* or *irritability* is a frequent complication of acutely inflamed and blind internal, but is seldom observed in chronic complete, fistula.

*Pruritus* of the anogluteal region, the result of excoriations and retention of pus in radiating skin folds, is a troublesome symptom of fistula, and agonizing itching unrelieved by scratching is sometimes induced by the lodging of a seed, fecolith, or other foreign body in the sinus.

*Loss of weight* accompanies tubercular, complicated by pulmonary involvement and chronic complex fistulæ that discharge freely, but is seldom observed in ordinary complete fistula.

*Fecal incontinence* is a rare complication and occurs only when there is extensive burrowing of the tract, the bowel is involved in tubercular, syphilitic, or malignant ulceration, or the sphincter has been severed during attempts to cure the fistula.

*Anxiety* is sometimes noticeable in fistula patients who believe the disease is incurable, requires a dangerous operation, or have been told that if the sinus is healed or operated they will subsequently suffer from lung involvement, skin lesions, or fecal incontinence.

*Discoloration* of the perianal skin is often observed, and a disagreeable odor emanates from some persons afflicted with fistula in ano.

When the sinus connects the rectum and bladder, urethra or vagina—rectovesical, recto-urethral, rectovaginal fistulæ—*cystitis*, *urethritis*, or the escape of gas or feces through the penis or vagina are troublesome.

Burning in the lower rectum and tenesmus are complained of when the mucosa is inflamed or excoriated by the acrid discharge.

*Excrescences* are occasionally observed on the perianal skin, where it is constantly bathed in the discharge, and daily staining of the drawers by pus usually occurs in fistula cases.

*Loss of sexual power* may complicate extensive anterior fistulæ involving the seminal vesicles.

*Fistulæ* and *scars* resulting from operations for their cure are predisposing causes of anorectal carcinoma.

*Unpleasant sensations* about the prostate and frequent mic-



turition are common manifestations of perineal and anterior rectal fistulæ caused by contraction of the levator ani muscle.

*Painful defecation* is annoying in acute and blind internal fistulæ near the anus, and when a foreign body lodges in a fistulous tract or opening at the anal outlet it incites sphincteralgia.

**Diagnosis.**—Usually the patient comes to the physician with a ready-made diagnosis, but when he does not, fistula should be suspected when his clothing and skin of the perianal region are smeared with *foul-smelling pus*. Rectal cancer, stricture, and ulcerative proctitis causing a discharge of mucus or pus alone or admixed have been mistaken for fistula in ano which would not have occurred if a clear history had been taken and the lower rectum and perianal region had been carefully examined.

It is not always easy to determine whether pus comes from an *abscess cavity* or fistula, but when the discharge is chronic and a subcutaneous tube-like induration can be defined, the patient undoubtedly suffers from fistula.

*Recent* are indicated by an abundance of thick yellow pus and tenderness, and *chronic* fistulæ by an absence of tenderness and slight thin, watery discharge.

While fistulæ are easily diagnosed, it is often difficult or impossible to locate all branching tracts and openings connecting them with the rectum.

When attempting a diagnosis one should bear in mind that fistulæ may (a) communicate with the rectum, skin of the anogluteal region, or neighboring organs, (b) have single or multiple openings, variable in shape, size, and location, (c) be single or multiple, straight or tortuous, and branch at one or more points, (d) be ordinary or tubercular, and (e) have internal openings that are usually located in the posterior median line  $\frac{1}{2}$  inch (12.7 mm.) above the anus or situated elsewhere.

A suitable table (Fig. 67), variety of probes (Fig. 77), speculum (Fig. 69), anoscope (Fig. 71), and convenient posture—Sims', lithotomy, or knee-chest (Figs. 60, 62)—is required for making an accurate diagnosis of fistula in ano.

When searching for fistulæ the buttocks are separated, anal margins everted (Fig. 41), radiating skin folds pulled apart, and the perianal region carefully inspected and palpated, otherwise they may be overlooked. When openings are found their number and appearance are carefully noted, because *small, round*, located in the center of small elevations, point to *ordinary* (Fig. 244), and *large, irregular-shaped* openings, with *bluish tinted* undermined edges, indicate *tubercular* fistulæ (Fig. 286).

Palpation of the anorectal mucosa, skin, and deeper perianal structures is essential, for in this way superficial and deep sinuses with their branches are detected through indurated or tube-like feel. Occasionally this is the only way in which *blind internal* and *submucous* sinuses and deep branches of *complete* and *horseshoe* fistulæ can be detected.

Frequently fistulæ that cannot be diagnosed in other ways are located by squeezing the perianal skin and deeper structures between the thumb and index-finger inserted in the rectum (Fig. 48). Direction of the sinus and its ramifications are determined chiefly by palpation (Fig. 238), probing, and noting fistula openings (Fig. 238).

Care and gentleness are exercised in probing, otherwise the instrument is forced through the fistula wall, leading the examiner to believe the sinus is *lengthy* when it is not, and an abscess may form as a result of infective agents carried into surrounding tissue by the probe.

Suitable *probes* (Fig. 77) are essential, and the collection should include *malleable* and *steel* probes of different lengths, and sizes with and without handles. *Ordinary* probes suffice for simple complete fistula, but deep, tortuous, complex sinuses are examined with stiff and soft probes attached to a large firm *handle*, so that one at all times may know in which direction the instrument is pointing. For the exploration of submucous and blind internal fistulæ stiff probes, bent at an acute or right angle  $\frac{1}{2}$  inch (12.7 mm.) from their extremities, are preferable (Fig. 77), for with them when the opening has been found the probe can be introduced and pulled to one side or downward, and direction and length of the sinus determined, and whether or not it runs beneath mucosa or skin.

Probes of this type are also useful for detecting inflamed crypts, ulcers having undermined edges, diverticula, foreign bodies, and penetrating wounds of the anal canal.

*Openings.*—Fistulous apertures may be microscopic or macroscopic in size, vary in number, shape, and location, and their edges may be smoothly rounded or irregular, ragged or undermined, and tracts connecting them may be straight or tortuous, and vary in width at different points, or the caliber may remain the same throughout.

In 95 per cent. of fistulæ the *internal* opening is located in the posterior median line at the sphincteric juncture (Fig. 234), whether the sinus travels upward or downward or around the rectum. In other instances fistulæ may penetrate the *anal canal*, *middle*

or *upper* rectum, or the sphincter muscle, but usually they enter the anal canal  $\frac{1}{2}$  inch (12.7 mm.) above the anus, posteriorly in the median line.

In *multiple* or *complex* fistulæ there are many openings (two to twenty) located in the skin and rectum, but the chief outlet is located near the anus at the usual site even in aggravated cases where there are two or more rectal apertures. Multiple openings are common in submucous and sinuses connecting ulcerated areas with each other.

*Internal* openings are usually detected with the finger by their indurated feel, granulations extruding through them, or through the proctoscope or speculum as dark points and sensitive depressions when probed.

*Submucous* tracts on digital examination are felt as elongated, boggy swellings paralleling the long axis of the bowel.

*Sinuses* opening in the perineum and anterior surface of the rectum are often associated with urinary, prostatic, Bartholin's gland, or vesical diseases, and such fistulæ are often caused by bruising the rectal mucosa during careless prostatic massage.

Fistulæ at the sides or posterior to the sacrum or coccyx are usually secondary to bone necrosis or encysted hair, and the sacrum and coccyx are carefully examined for disease or overlying dermoids (Fig. 243).

Internal openings not found after eversion of the anal margin are quickly located with a hooked probe following the introduction of the author's slanting anoscope (Fig. 71). When a sinus penetrates the rectal wall to the mucosa in 95 per cent. of fistulæ an internal opening exists whether it is discovered or not.

In complicated cases when following examination there is still doubt regarding the number and location of openings in the skin, rectum, and neighboring organs, and to define tracts for operative purposes, the injection of fistulæ with iodine, methylene-blue, milk, permanganate of potassium, barium, or plaster of Paris is occasionally helpful.

Radiographs (Figs. 245, 246) made following the introduction of barium or Beck's paste into fistulous tracts often assist one to determine the number and direction of sinuses in complicated, doubtful cases, but are misleading when paste has been forced through the tract and into surrounding fat. The author has seldom found coloring fluids or radiographs necessary for diagnostic or operative purposes and has known methylene-blue and Beck's paste injections to rupture the fistula wall and escape into the loose areola tissue, indicating the necessity of an extensive opera-

tion, when originally the sinus was straight and could have been easily divided with less cutting.

Bismuth paste frequently blocks the main channels, leaving branch sinuses untouched, where pus accumulates, forming an abscess that opens at a new point. The author holds that surgeons who cannot diagnose fistula without colored fluids, radiographs, or Beck's paste are incapable of operating upon complex anorectal fistulæ.

For the differential diagnosis between tubercular and ordinary fistula the reader is referred to Chapter XXV, where the subject has been fully discussed.



Fig. 245.—Radiograph showing perimetral abscess and fistula draining into the perirectal space defined with Beck's paste.

**Prognosis.**—The *prognosis* is good or bad depending on the vitality of the patient, experience of the operator, and whether or not postoperative treatment is intelligently carried out.

In more than 5000 operations performed for the relief of ordinary fistula the author has not lost a patient or been compelled to operate the second time in more than 5 per cent. of cases, but the severing of *bridged over tissue* during convalescence was necessary in many instances.

Occasionally patients afflicted with pulmonary or anorectal tuberculosis, locomotor ataxia, diabetes, Bright's disease, ulcerative colitis, cancer, or wasting disease may die from the disease, exhaustion, or the result of etherization in patients having latent tubercular foci in the lungs, or other complications following extensive operations for multiple or complex fistulæ.



While the prognosis is good in fistulæ, one must be careful about prophesying the time required to heal them, because weeks in some and months are necessary in other cases to effect a cure, depending on extent and depth of the sinus, the patient's health and complicating disease; in apparently healthy individuals similar wounds do not heal with equal rapidity.



Fig. 246.—Radiograph showing ramifying multiple perirectal fistulæ connected with the rectum by small opening cured by Beck with his paste injections.

When the patient suffers from pulmonary tuberculosis, or fistula is primarily tubercular, or the patient is devitalized from any cause, it is unwise to give an opinion how long it will take to heal the wound, and whether or not a second operation will be required.

## Chapter XX

### Anorectal Fistula (*Continued*)

#### TREATMENT

**Prophylactic and Non-operative.**—Fistula in ano is secondary to abscess in 95 per cent. of the cases, and in the remainder usually results from injuries, fissures, rectal ulceration, or other lesions that afford a lodging-place for feces, septic organisms, and foreign bodies.

Fistulous tracts show little tendency to heal spontaneously because of *imperfect drainage, escape of feces and infective agents into the sinus, activity of the sphincter and levator ani muscles, or depleted condition of the patient by local pulmonary tuberculosis or wasting disease.*

Many individuals suffering from anorectal fistula decline operation because they believe it incurable, have been told they will develop skin disease or lung trouble if the sinus is healed, or suffer from fecal incontinence if the tract is divided. The author encourages these sufferers, and unless they have anorectal or pulmonary tuberculosis tells them they need not fear such complications and may expect a permanent cure if they will undergo an operation and follow instructions regarding postoperative treatment.

Many physicians and surgeons believe it easy to operate and heal fistula in ano, but the proctologist who sees many cases knows this is not true, and that a perfect operative technic and painstaking postoperative treatment are required to cure fistula.

Of the author's fistula patients at the New York Post-Graduate and Broad Street Hospitals, from 30 to 60 per cent. had been previously operated upon.

Surgeons who would excise the colon, remove the spleen, open up the pleural cavity, remove a portion of the brain, or perform hip-joint amputation lose their nerve when it comes to cutting the sphincter, which is essential in most fistula operations. When they learn that fecal incontinence is not due to cutting of the muscle, but to incorrect handling of fistula wounds, and overcome their faulty operative technic their patients will be cured by one instead of multiple operations.

Almost daily the author has patients referred to him who have been operated upon anywhere from two to twenty times, who are easily cured when the sinus and its branches are incised and the wound is drained, instead of being packed, which destroys new granulations leaving a sulcus that keeps sphincter ends apart and permits involuntary escape of feces.

Anorectal fistulæ are operable unless caused by cancer or high stricture with extensive ulceration, there is enormous destruction of tissue from primary tubercular lesions, or the patient is so debilitated from arteriosclerosis, circulatory disturbances, diabetes, Bright's disease, or pulmonary tuberculosis that the wound would not heal following operation.

The author does not decline to operate because the sufferer has a tubercular sinus or ordinary fistula complicated by pulmonary foci or wasting disease where his vitality is fair, and has cured many such patients after other surgeons had refused operation. It is useless to operate on persons having ordinary or tubercular anorectal fistula, who are devitalized from any cause, since they would not recover and suffering would increase or death hastened.

Unless there is a special reason for doing otherwise, *acute* fistulæ, complicated by active cellulitis and abundant discharge that drains freely, are not operated *immediately*, so as to give the abscess cavity an opportunity to contract and inflammation to subside, so that a smaller wound is left, the patient suffers less, and recovers more quickly. In the meantime the abscess cavity is drained and tract is cleansed and the patient kept comfortable with peroxid of hydrogen irrigations and applications of boric acid fomentations to the inflamed area. When this treatment reinforced by morphin, gr.  $\frac{1}{4}$  (0.016), and when necessary enlarging the opening to relieve pain and facilitate drainage does not arrest the suppurative process, the abscess and fistula are freely incised, cureted, cleaned, swabbed with carbolic acid, and packed with gauze.

To be successful in the treatment of fistula in ano the surgeon must familiarize himself with the cause, number, direction, and character of sinuses and their branches, otherwise results are unsatisfactory and the patient must undergo further treatment.

The treatment of anorectal fistulæ in a series of cases is *prophylactic*, *non-operative*, and *surgical*.

**Prophylactic Treatment.**—Fistulæ are often prevented by healing fissures, curing ulcerative proctitis, draining infected crypts, excising hemorrhoids, incising strictures, removing foreign bodies, building up the system, and radically operating upon anorectal abscess as previously outlined in Chapter XVII.

The formation of abscess and fistula is avoided in tubercular individuals by removing patients from unsanitary surroundings, having them cease work in poorly lighted and badly ventilated rooms, and, when imperative, go to the mountains, spend their time in the fresh air, sleep with windows open, and eat abundantly of nourishing food.

The majority of fistulæ result from incomplete abscess operations or incorrect manner in which wounds are handled.

**Non-operative Treatment.**—In rare instances fistulæ are healed without operation by establishing *free drainage, cleanliness, and applying irritants* or *electricity* to, or *injecting the sinus with bismuth paste* (Fig. 246), and by the *ligature* or *seton method*.

**Free Drainage.**—Fistulæ, however treated, seldom heal unless the tract and its branches drain freely and pus is prevented from collecting, hence in their conservative treatment openings are dilated or enlarged with a knife sufficiently to permit the discharge to escape freely.

**Cleanliness.**—Fistulous tracts are swabbed when straight and large, but if tortuous, branched, or their openings are contracted, they are frequently cleansed with hydrogen peroxid, bichlorid, or other antiseptic, which is injected into the tract with the author's fistula syringe until the solution comes away clear.

**Application of Irritants.**—Agents that supposedly stimulate healthy granulations, such as silver nitrate, copper, zinc, iodine, and carbolic acid, are sometimes employed in the treatment of fistula in ano. Better results are obtained when the external opening is enlarged to facilitate drainage before the tract is irrigated, dried, and treated with the cauterant.

Pain is minimized by swabbing or injecting the tract with cocain 10 per cent. or infiltrating perifistula tissues with a  $\frac{1}{8}$  per cent. eucain solution. The most reliable irritant solutions employed in the conservative treatment of fistula are silver nitrate 25 to 75 per cent., zinc sulphate 50 per cent., and iodine or carbolic acid in full strength. The fistula is swabbed with one of these agents unless the sinus is small, tortuous, or branched, when the solution is forced into it with the author's fistula syringe (Fig. 249). The author temporarily plugs the opening with cotton to prevent leakage, keeps the stimulant or cauterant in contact with the tract wall, and protects the patient's skin and hands from injury or staining.

Best results are obtained when the rectal end of the sinus is kept from fecal contamination, hence the author introduces a threaded probe with an attached pledget of cotton into the rectum; the probe is then caught with forceps and brought outside the



anus, pulling the cotton through the tract until it rests immediately beneath the mucosa, when the thread is left dangling from the anus.

Treatments made once in ten days or two weeks induce some discomfort and temporarily augment the discharge. In suitable cases the tract is cauterized by the introduction of a probe upon the point of which silver has been fused.

Irritant applications seldom cure anorectal fistula, but when successful the sinus heals from above downward and discharge gradually diminishes until it ceases. When the tract is nearly



Fig. 247.—Radiograph of blind perirectal fistula outlined and cured by Beck with one bismuth paste injection.

closed the cotton pledget is removed by jerking on the thread, and a few drops of silver 20 per cent. are injected into the rectal opening exposed through the window of the author's anoscope.

*Electricity.*—*Electrolysis* has been employed in the treatment of anorectal fistula, but seldom with success. Cures have been reported where lining of the sinus was destroyed with a needle heated red hot, and in such cases healing followed sloughing out of burned fistula lining.

*Electrochemical* agents have been used, but are not more dependable than irritants injected into the tract. Oxychlorid of

copper produced on a copper electrode connected with the positive pole remaining in contact with the fistula wall is claimed to have been successfully employed by electrotherapeutists. The negative pad is placed over the abdomen or buttocks and the application is continued until the fistula lining is discolored by the oxychlorid; treatments increase the discharge, but in successful cases it gradually diminishes as the sinus heals. The electric treatment of ano-rectal fistula is unreliable and never practised by the author except at the solicitation of patients who decline operative interference because they fear fecal incontinence will follow.

*Bismuth Paste.*—Beck's paste, composed of 1 part of bismuth subnitrate and 2 parts of vaselin, useful in the treatment of sinuses elsewhere, is seldom effective in the treatment of fistula in ano.



Fig. 248.—Radiograph of fistula with branch sinuses extending high into the pelvis successfully treated by Beck with his paste.

Of 50 cases treated by the author, injection of tracts with bismuth emulsion was successful in but 2 instances. The author has abandoned the method except in deplorable *inoperable* cases, because the treatment is tedious, usually fails, and when force is used bismuth sometimes ruptures the main tract or gets caught in branch sinuses, where it later causes irritation or toxic manifestations.

*Technic.*—The warmed emulsion of proper consistence drawn into a strong syringe having a nozzle that fits the external opening (Fig. 249) is forced slowly through the tract and its branches. The paste congeals at the body temperature, but this can be hastened by the application of an ice-bag.

Where the sinus has multiple outlets and a large internal opening they are plugged until the injection is completed to prevent escape of the bismuth before all parts of the fistula have been distended. Treatments are made once or twice weekly following thorough cleansing and drying of the sinus. The curative power

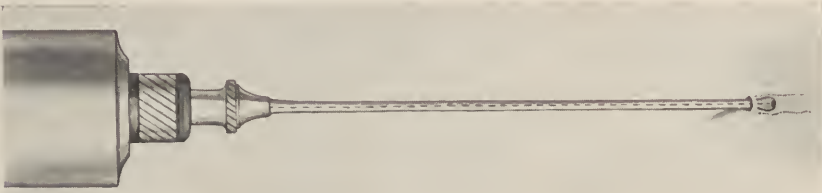


Fig. 249.—Syringe attached to which is the author's probe-pointed cannula employed for irrigating sinuses and injecting fistulæ with Beck's paste.

of bismuth paste is due to its irritant bactericidal and splint-like action.

As healing takes place the discharge gradually diminishes, and by occasionally taking radiographs (Fig. 245) one can determine whether or not the case is progressing.

## Chapter XXI

### Anorectal Fistula (*Continued*)

#### SURGICAL TREATMENT

**General Remarks. Why Fistula Operations Are Unsuccessful. Classification of Fistula Operations. Preparation of the Patient. Instruments Required. Anesthesia Employed.**

**General Remarks.**—Time should not be lost in attempts to cure fistula by *non-surgical* measures because they are tedious, induce unnecessary suffering, and fail in 95 per cent. of cases.

The author operates for fistulæ in ano promptly upon obtaining the patient's consent unless they are complicated by extensive anorectal tubercular ulceration, the patient's health is so depleted by pulmonary tuberculosis or other disease that the wound would not heal, or the sinus complicates non-malignant or cancerous obstruction of the rectum. Many physicians and surgeons regard fistula as a minor ailment, easy to cure, but these sufferers previously operated on one or several times learn to their sorrow that the reverse is true. The author knows of no other non-malignant anorectal affection that requires more time, patience, and ingenuity to cure than the average complete horseshoe or complex fistula.

**Why Fistula Operations Are Unsuccessful.**—General practitioners and surgeons fail in the operative treatment of anorectal fistula in about 50 per cent. of their cases because they

1. Do not differentiate between ordinary and tubercular sinuses.
2. Fail to divide or excise the main tract with all its branches.
3. Omit to completely sever the anal sphincter.
4. Firmly pack instead of lightly draining the wound, which destroys healthy granulations.
5. Cut the anal muscle obliquely or in zigzag (Fig. 291) fashion in lieu of at a right angle (Fig. 252).
6. Do not provide free drainage by making the skin end lower than the rectal extremity of the wound.
7. Infect the incision by needless probing.
8. Permit the skin or mucosa to grow into the cut and separate the sphincter ends.
9. Unnecessarily destroy healthy granulations with caustics or Paquelin cautery.



10. Leave pockets or an uneven surface to catch septic material in place of leveling the wound throughout.

11. Keep feces fluid, which irritate or infect the incision, or hard and nodular, so they traumatize the wound when evacuated.

12. Fail to distinguish proud flesh or soft from healthy granulations, and treat them accordingly.

13. Frequently introduce finger, speculum, or proctoscope into the rectum, which lacerates the wound and delays healing.

14. Allow the cut to bridge over at one or more points.

15. Permit the skin end of the wound to close before the rectal segment has healed.

16. Weaken the patient by restricting him to fluids instead of permitting a full mixed diet.

17. Insist on keeping debilitated and tubercular individuals in bed in lieu of the fresh air during postoperative treatment.

18. Fail to keep gauze in the bottom of the wound throughout its entire length.

19. Attempt to cure fistula by incising it piecemeal, on the installment plan.

20. Omit to build up the general health of debilitated patients before operating.

21. Do not change dressings as soon as saturated with pus.

22. Force the grooved director or probe into and infect the tissues when inserting drains or packing.

**Classification of Fistula Operations.**—Successful surgical procedures must provide for *free drainage*, *division* or *extirpation* of the fistulous tract and its branches.

The following operations have been employed in the treatment of anorectal fistula:

1. Ligature.

2. Incision—division—fistulotomy.

3. Excision—fistulectomy.

Of the procedures named, *incision* and *excision* are the most dependable.

**Preparation of the Patient for Fistula Operations.**—When the *division* operation is chosen preparation of the patient is simple and consists in administering a light laxative the night before, small enema half an hour previous to operation, and swabbing the rectum with hydrogen peroxid or weak iodine solution just before the sinus is divided.

When fistula is to be *excised* more elaborate precautions are necessary to insure primary union; the patient is kept on fluids for two days, during which time the intestine is emptied and



cleansed by laxatives and soapsuds enemata. On the morning of operation morphin, gr.  $\frac{1}{4}$  (0.016), alone or in combination with an astringent, is administered to tie up the bowel; the rectum and colon are irrigated with hydrogen peroxid 25 per cent. and the skin is shaved and painted with a 2 per cent. iodine solution. Shaving and iodine are objectionable in other fistula operations because there is little danger of infection from correctly drained free incisions, outgrowing hairs cause considerable annoyance, and iodine irritates the skin.

*Position.*—The patient is usually placed in the Sims or lithotomy posture with the hips raised or the table tipped upward, which brings the fistula opening into view and permits the operator to work with ease, but the Sims posture is preferable in the majority of cases where local is substituted for general anesthesia.

*Instruments.*—Few instruments are required in fistula operations—probes (Fig. 77), grooved directors (Fig. 250), scissors (Fig. 251), curved bistoury (Fig. 252), artery forceps, curet, gorget (Fig. 259), and strong retractor (Fig. 263), all of which should be accurately made of the best steel.

*Probes* are essential, and the set (Fig. 77) should contain short and long, large and small, malleable and stiff, straight and angulated, and probes without and having handles, that the examiner may at all times know the direction the instrument is taking. Small are used for diminutive, and larger instruments for fistulæ having a greater caliber because the former sometimes penetrate the tract wall. Malleable are suitable for tortuous, but steel or stiff probes are more useful for exploring long straight sinuses; soft probes can be bent and used in blind internal fistula, but the author prefers *steel* probes bent at an acute or right angle (Figs. 77, 220, insert *A*) having a firm handle.

*Grooved Directors.*—The author has designed grooved directors variable in size and shape (Fig. 250), most of which are made of steel, since malleable directors bend at inopportune times, delaying the operator, and are worthless thereafter.

Straight are employed in *superficial* and curved directors are used when dividing extensive *deep* fistulæ. Where the sinus penetrates deeply and the outer opening is a considerable distance from the anus a straight instrument frequently cannot be made to enter the rectal end of the sinus. The author's grooved directors have straight, curved, graduated, *probe-pointed* ends (Fig. 250), which enables him to dispense with probes and operate quickly, since the tract is divided over the inserted grooved director (Fig. 252) without the necessity of substituting a director for the probe,

as is usually done after the size and direction of the sinus has been ascertained by probing.

An *ordinary* is employed when dividing blind internal fistulæ that run upward, but when the sinus travels downward and backward beneath the skin or mucosa the author's *angulated* grooved director (Fig. 261) is substituted because it greatly facilitates the operation (Fig. 262).

*Knives.*—A light sharp-pointed curved serves for operations on blind internal and subcutaneous sinuses, but a long strong bistoury is required for dividing fistulous tracts that are extensive, deep, and indurated, having external openings at a considerable distance from the anus. The author has broken several poorly constructed knives during such operations, and on three occasions had great difficulty in discovering and removing broken blades. The author has designed a probe-pointed scissors (Fig. 251) with

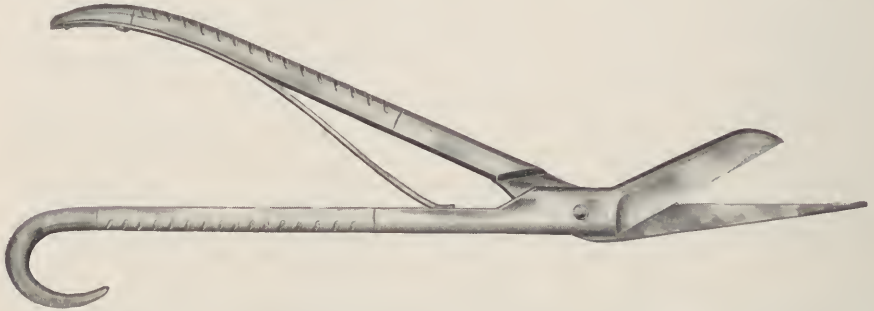


Fig. 251.—Author's probe-pointed fistula scissors which render probe, grooved director, and bistoury unnecessary in ordinary complete fistula operations.

which fistulæ are quickly divided without the aid of probe or grooved director.

*Scissors.*—With the author's *probe-pointed fistula scissors* (Fig. 251) most complete sinuses are quickly divided without the aid of other instruments. Sharp-pointed scissors are undesirable in this work because they are difficult to use and often fail to cut dense tissue. The author prefers long, strong, straight scissors having narrow blunt extremities because they easily follow the director or divide the sinus when employed independently.

*Artery forceps* are useful for catching spurting vessels and holding edges of skin and mucosa while they are being excised with scissors.

*Curets.*—The author curets nearly every divided fistula, using a small semisharp for recent and a bone curet for old fibrous sinuses.



*Gorget.*—A steel or, preferably, wooden gorget (Fig. 259) is sometimes required in extensive fistula operations when the internal end of the grooved director cannot be brought outside the anus, and overlying structures divided on account of resistance of the indurated tissues; in such cases the knife is guided inward by the director and pushed into the wooden gorget, introduced into the rectum for the purpose, when both are simultaneously withdrawn, dividing the fistula and intervening structures (Fig. 259).

*Needles and Catgut.*—A strong curved needle and catgut are used for suturing wounds made when excising fistulæ (Figs. 263, 265) or branch sinuses when the main tract has been drained and left open to heal by granulation (Fig. 269).

*Anesthesia.*—Fistula patients often postpone or decline operation when informed they must go to a hospital and be operated under *general anesthesia*, but readily consent to surgical intervention when told fistula can be almost painlessly divided or excised under *local anesthesia* in a few minutes (Figs. 254, 265), and the operation will keep them in bed but a few days if at all. (See Chapter VI on Anesthesia.)

Most sinuses travel beneath the skin, mucosa, or subcutaneous fat, and general anesthesia is unnecessary in these cases. During the last fifteen years the author has employed local in 70 and general anesthesia in 30 per cent. of his fistula operations.

Local anesthesia is indicated in fistula operations irrespective of the length, number, and direction of superficial or sinuses tracking not more than  $\frac{1}{2}$  inch (12.7 mm.) beneath the skin, but general anesthesia is preferable when fistulæ penetrate deeply into muscles and fascia, travel upward outside the rectum, originate in the pelvis, neighboring organs or bony structures, and when they are complicated by another rectal disease requiring considerable cutting.

The author does not attempt to divide or excise fistula under local anesthesia until the character, length, direction, and depth of the sinus and its branches have been ascertained by inspection, palpation, probing, injection of staining fluids, or radiographs (Figs. 247, 248).

When there is doubt as to whether or not the case is suitable for *local*, the operation is performed under *general anesthesia*, gas, gas-ether, or gas-oxygen, unless the patient is afflicted with heart trouble, pulmonary tuberculosis, nephritis, or other affection that makes general narcosis unsafe.

*Gas* or *gas-oxygen* anesthesia is satisfactory for the short opera-

tion needed to cure fistula. *Chloroform* is seldom employed because it is more dangerous, and *ether* is unsatisfactory since it aggravates the condition of patients having active or latent tubercular foci in the lung and may incite or augment nephritis. *Gas-ether* anesthesia is occasionally resorted to in prolonged extensive operations for non-tubercular sinuses.

Several local anesthetics have been employed with more or less success in fistula operations—*beta-eucain*, *cocain*, *stovain*, *novocain*, *apothesine*, etc., *sterile water*, *quinin and urea*, and *ethyl chlorid spray*, but of these the author prefers eucain in the strength given below. Ethyl chlorid was discarded years ago because it induced incomplete anesthesia, is painful, and may be followed by sloughing.

A quinin and urea 1 per cent. solution properly injected induces analgesia that lasts during operation and minimizes post-operative pain for hours, but the author seldom employs it except for *ambulatory* patients, because extensive sloughing has resulted and wound edges are left indurated and require longer to heal than when eucain is employed. The author has painlessly performed thousands of operations under *beta-eucain* anesthesia, and found it universally satisfactory for fistula and other anorectal operations because it can be *resterilized*, is *non-toxic*, and always *produces complete anesthesia* when used in proper strength and tissues are intelligently infiltrated.

The author employs  $\frac{1}{8}$  of 1 per cent. solution, and in his hands eucain has not caused annoying toxic symptoms or other serious complications in thousands of cases, nor has he been compelled to abandon operation in a single instance because anesthesia was incomplete.

Adrenalin chlorid added to a eucain solution minimizes bleeding during operation and lengthens anesthesia, but subsequently causes relaxation of tissues and favors bleeding subsequent to the removal or division of fistula, hence is seldom employed by the author, who wishes to see and control bleeding before the patient is placed in bed.

Weak solutions of novocain, stovain, and apothesine are fairly satisfactory, but in this class of work must be used in greater strength, but possess no advantage over eucain. Cocain is undesirable because it invariably causes alarming toxic manifestations when injected in considerable amount when the solution is employed weak or strong.

To be effective the anesthetizing solution must be injected freely into subcutaneous or submucous tissue overlying the sinus

to be incised and cureted and on all sides of the fistula when it is being excised.

Anesthesia is incomplete when all or a part of the solution is permitted to escape through fistulous opening or multiple needle punctures made before tissues are *blanched* by infiltration which indicates complete anesthesia.

*Common and Special Types of Fistula.*—After describing operations employed in the curative treatment of the more *common* types of fistula—(see Chapter XVIII)—*complete, blind internal, blind external, complete internal, complete external, horseshoe, complex, and complete*, the author will discuss the surgical treatment of *special* types of fistula (see Chapter XXIV).

## Chapter XXII

### Anorectal Fistula (*Continued*)

#### SURGICAL TREATMENT

**Incision—Division Operation—Fistulotomy.—Division Operation—Fistulotomy.**—The incision operation consists in dividing fistula with knife, seissors, ligature, cautery, or *écraseur*, and encouraging the wound to heal by granulation. The knife or seissors are preferable to the ligature, which puckers the tissues, causes prolonged pain, and requires days or weeks to cut out. The *écraseur* is barbaric, and unnecessarily lacerates the parts.

Tubercular fistula are divided with a Paquelin cautery point (Fig. 286) to seal lymphatics and prevent extension of the tubercular process to joints and other organs, but the cautery is not employed in non-tuberculous sinuses because burning induces pain during and following operation, prolongs convalescence, since healing does not begin until cauterized tissue sloughs away and is responsible for cicatrices that may prove annoying.

*Incision* is not so old as the *excision* operation, but has been in use many years, and was originally performed on Louis XIV, King of France, by Monsieur Felix, who devised a curved, sharp-pointed bistoury for the purpose.

*Division is the procedure of choice* for fistula in ano because it is suitable for all types, brings excellent results, is quickly performed under local or general anesthesia, few instruments are required, is seldom complicated by troublesome bleeding, rarely causes fecal incontinence, postoperative dressings induce little pain, and infection rarely follows operation.

Periodically surgeons bring forth a new excision as a substitute for the division operation, hoping to obtain primary union and a short convalescence, but soon abandon the procedure for incision, which is always reliable.

Submucous and subcutaneous (Fig. 235) fistulæ are incised under eucain infiltration ( $\frac{1}{8}$  per cent. solution) irrespective of their number, length, or branches, and gas-oxygen or gas-ether anesthesia is employed for extensive deep boring sinuses. Ether is contraindicated in pulmonary subjects because it fires up latent and active tubercular foci in the lungs.



The *ambulant* treatment is practised by the author in the majority of fistula cases because the average sinus is short or superficial and can be successfully incised in the office or home under local anesthesia, and is preferable because the patient does not fear operation, is not required to forego social or business engagements, remain in a hospital, take a general anesthetic, engage a nurse, and undergo considerable unnecessary expense.

Advertising rectal specialists anesthetize and divide fistula  $\frac{1}{2}$  inch (12.7 mm.) at a time at periods of a week or more apart, which prolongs the patient's mental and physical suffering without recompensing him in any way. The author incises short or long superficial sinuses completely at one operation, which requires little if any more time, and causes less suffering than segmental division of the tract.

Ambulatory patients are kept comfortable and up and about with suppositories containing morphin or cocain, gr.  $\frac{1}{8}$  (0.008), and extract of belladonna, gr.  $\frac{1}{4}$  (0.016), introduced two or more times daily. The technic of the ambulant does not vary from the hospital operation, and postoperative treatment is the same in both.

Formerly the author believed rest in bed and abstaining from walking hastened healing, but increased experience has demonstrated that fistula heals satisfactorily when the patient either stays in bed or carries on his business, when dressings are regularly and intelligently made.

Following division of extensive or deep burrowing sinuses patients were formerly kept in the house or hospital from four to ten weeks, but in recent years the author has permitted them to come to the office for dressings in from four to ten days or as soon as they can walk comfortably, and results have been more satisfactory because this class of sufferers do not always improve when confined to bed and being dressed by an inexperienced nurse or intern.

Postoperative infection is rarely observed following incision operations where the tract and its branches have been completely divided, overhanging edges of skin and mucosa have been excised, uneven places and pockets in the cut are leveled, and the skin end of the wound is made lower than the rectal to insure free drainage, but when these precautions are not taken tedious preparation of the patient for operation and the employment of antiseptic washes and dressings are of no value.

Ordinary straight, complete sinuses are divided with a sweeping incision following introduction of the grooved director, but

tortuous and deep burrowing extensive fistulæ are incised *step by step* as fast as anesthetized and the director can be made to follow.

Bleeding from fistula operations may be copious, but is seldom alarming because it is promptly controlled by hot-water compresses, ligation of spurting vessels, plugging the wound with gauze, suturing, or clamping high oozing, freely bleeding areas with pressure forceps having detachable handles (Fig. 549) which are left *in situ* for several hours.

Vessels in mucosa and skin are small, but those located in the submucosa, bowel musculature, and perirectal spaces are large and bleed freely when injured. When hemorrhage is not profuse following long deep anorectal cuts it is because incisions are made between important vessels paralleling the bowel.

Adrenalin in the local anesthetic lengthens analgesia and minimizes bleeding during operation by constricting capillaries, but subsequently courts hemorrhage, since it secondarily causes relaxation of vessel walls.

Tracts and their diverticula may be defined by injecting them with bismuth paste (Fig. 249)—bismuth 1 and vaselin 2 parts—methylene-blue, milk, iodine, plaster of Paris, and other distending or staining agents, but the author seldom employs them, since he has little trouble in tracing fistulæ with the probe, director, finger, or eye, and because sinuses are sometimes ruptured when forcibly injected with these agents which makes cutting unnecessarily extensive and confuses the operator. Some surgeons divulge the sphincter preceding fistula operations, but this is unnecessary except for purposes of exploration, since the muscle is put at rest when the sinus is incised.

Failure of fistula wounds to heal is often attributed to activity of the sphincter, but if this were true a cure would not follow its division because rest of the wound is not entirely accomplished, owing to frequent contraction of the levator ani and other anorectal muscles. Incision of the sphincter insures free drainage and laying open of the internal end of the sinus.

*Cutting the sphincter* by inexperienced surgeons has been followed by fecal incontinence, and because of this they frequently attempt to cure fistula without incising the muscle, or minimize danger from incontinence by partial division of the sphincter, which is not practical owing to its thinness. When the tract enters the rectum beneath the muscle *a cure will not follow unless the sphincter is severed.*

Incision of the sphincter is *unnecessary* when the fistula tracks

*immediately beneath skin or mucosa* because the sinus is laid open external to the muscle.

*Multiple openings, sinuses, and diverticula* confuse operators because they do not understand their relation to the sphincter and how to deal with them. In 95 per cent. of cases there is but a single opening in the rectum located in the posterior commissure  $\frac{1}{2}$  inch (12.7 mm.) above the anus at the juncture of the internal and external sphincters.

When two or more fistulæ enter the rectum *multiple* division of the muscle is imperative, but if the operation is rightly performed and the wound properly handled fecal incontinence rarely follows.

Formerly the author believed severing of both sphincters invariably caused fecal incontinence, but experience has demonstrated that this is not so, since he has simultaneously divided these muscles in hundreds of fistula and fissure operations without causing incontinence. Loss of control over movements is prone to follow extensive operations for deep *burrowing* fistulæ, particularly those entering the perirectal spaces unless precautionary measures are taken to prevent it; because rectal support is undermined, ligaments are severed, the external and internal sphincters and the levator ani muscles are divided, and nerves controlling the anorectal musculature are injured.

When fecal incontinence follows fistula and other anorectal operation without apparent cause the patient should be examined for a congenital defect, injury, or disease of the spinal cord or brain centers controlling the anorectal region, nerve affections, pulmonary tuberculosis, or wasting disease that sometimes cause weakening or paralysis of the sphincter.

The author has treated many patients for fecal incontinence operated on by others, but in his cases loss of sphincteric control occurred in only 1 per cent. of 1000 *private*, and in less than 5 per cent. of 1000 *clinic* or *out of town* fistula operations where post-operative treatment was left in the hands of an assistant, intern, or family physician.

A study of these operations has convinced him that *fecal incontinence* is not due so much to cutting the sphincter as to the surgeon's *imperfect operative technic* and *bad management* of the wound, cutting the muscle *obliquely* or in *zigzag* fashion rather than at a *right angle* (Fig. 252), *tightly packing* instead of *loosely draining* the wound, *permitting skin or mucosa* to grow into the cut, *frequently cauterizing* the incision, *unnecessarily pulling apart* and *probing* the wound, *neglecting dressings* so that *acrid discharges collect*, *severing the sphincter at two or more points* (Fig. 268), and



*needlessly dividing ligaments, nerves, and muscles connected with the anorectal mechanism.*

*Multiple openings in the mucosa may be joined by an incision without danger of incontinence, but when sinuses pass through the bowel wall they are cautiously divided unless located in the posterior median line one above the other, in which case they are connected by a single straight incision.*

The author has operated on patients where there were from six to forty-eight openings (Figs. 242, 268) located in the rectum, on the buttocks, and labia and vagina, where he succeeded in laying open all sinuses without cutting the sphincter any more than once by separately incising connecting fistulæ up to the sinus entering the rectum, which was divided last.



Fig. 252.—Dividing the sphincter at a right angle after the fistulous tract has been incised at the side of the anus.

Tracts running to the upper extremity of the internal sphincter may be divided with little danger of incontinence, but in fistulæ tracking high up posteriorly or at the sides of the rectum cautious cutting is necessary, otherwise injury to sphincters, levator ani, ligaments, or nerves may result in partial or complete fecal incontinence.

Sometimes when they have failed to heal following dilatation, curetage, and draining high running sinuses are cured by repeatedly injecting them with Beck's bismuth paste or a 10 per cent. silver nitrate solution after they have been cleansed and dried.

When a fistula passes upward above the peritoneal attachment the lower is incised freely and the upper extremity of the sinus is dilated, cureted, swabbed with carbolic acid, and drained, a curative procedure that provides for free drainage and stimulates healthy granulations.



Following laying open of fistulæ the author has succeeded in healing posterior high running connecting tracts by removing the coccyx, exposing, cureting, and draining them.

Where the patient is debilitated and suffers from pulmonary tuberculosis, multiple, or lengthy deep fistulæ complete division is sometimes impracticable because the sufferer lacks vitality to

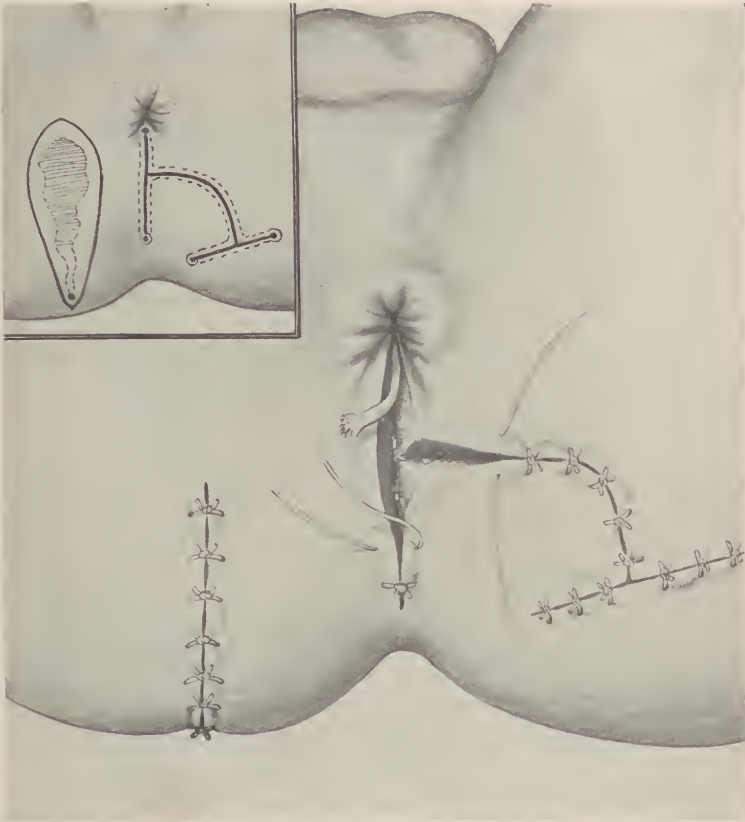


Fig. 253.—Fistulous sinuses closed after division. Method of completely (left) and partially (right) closing and draining fistula wounds. Insert shows location of sinuses and lines of incision employed in their excision and division.

heal the wound due to the exhausting discharge, and under such circumstances the author occasionally anesthetizes and divides the sinus piecemeal after the plan outlined.

When *local* is not feasible, the rectal end of the tract subjected to fecal infection is incised under *gas* anesthesia, and the remainder is dilated, cureted, and drained through counterincisions made along its course.

In extensive fistulæ where speedy convalescence is urgent and complete excision and suturing wounds are impracticable, sinuses and branches are laid open or excised, following which the distal extremity of the main cut and branch incisions are closed with chromicized *buried* and *superficial* plain catgut stitches, while the rectal end of the wound is drained and left to heal by granulation (Fig. 253).

Extensive fistulæ, including their branches, are simultaneously operated unless the patient's vitality is very low, when a two-stage operation is advisable.

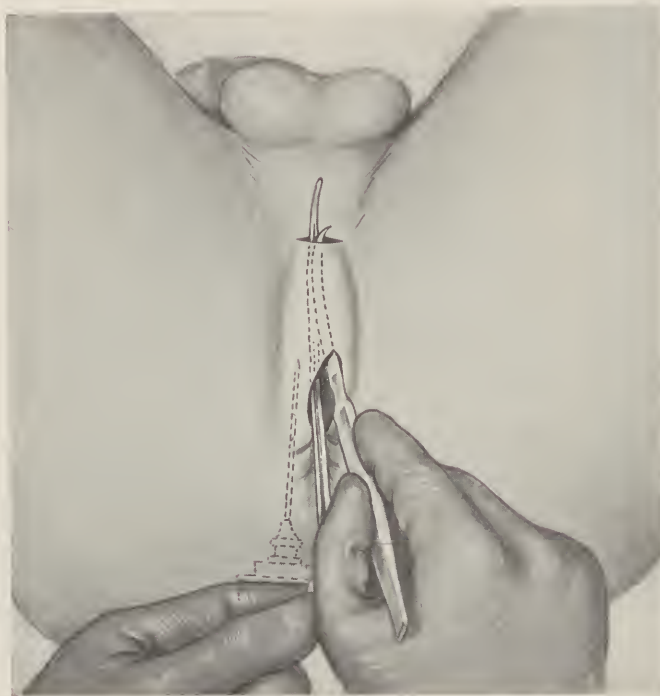


Fig. 254.—Method of anesthetizing and dividing a rectoperineal sinus under infiltration anesthesia.

Where multiple openings are situated on different sides of the anus and severing tracts necessitates cutting the skin entirely around the anus the operation is performed in successive stages under local anesthesia to prevent retraction of the rectum and stricture.

Some surgeons defer operating *acute* freely discharging fistulæ, but the author knows of no reason for doing so unless the tract is to be excised and the wound sutured later.

*Technic of division*—incision—is more simple than the *excision* operation for fistula. The average sinus is easy to incise under local (Fig. 254) or general anesthesia, but marked ingenuity is required to successfully cure deep burrowing, branching, and sinuses connected with other organs.

Ordinary complete, blind external, and uncomplicated internal fistulæ are operated under local anesthesia, but when there is doubt as to the character and extent of the operation or complications it is performed under gas-oxygen anesthesia.



Fig. 255.—Technic of dividing an extensive complete fistula following eucainization of overlying tissues.

The manner of dividing *complete* will be described first, since the underlying principles involved in this are the same as for other types of fistulæ in ano.

After the patient has been put to sleep or tissues external to and about the tract have been *infiltrated* until blanched with a  $\frac{1}{8}$  per cent. eucain solution a steel straight or curved probe-pointed grooved director (Fig. 254) is introduced along the sinus and into the rectum, when it is caught with the left index-finger, withdrawn, and left resting across the anus (Fig. 255). Tissues resting on the director are then severed by a sweeping incision made with a curved sharp-pointed bistoury (Fig. 255) or less slowly with scissors (Fig. 256), following which the open tract is cureted, split

internally—Salmon's cut—dried, and examined for branch sinuses, which are laid open step by step as defined.

The operation is completed by removing overlapping edges of skin or mucosa and sclerotic or necrotic tissue, leveling the cut so pockets are not left, and deepening the skin end of the incision to insure free drainage.

Spurting vessels are ligated, oozing is arrested with hot-water compresses, and the wound is tightly packed with gauze and

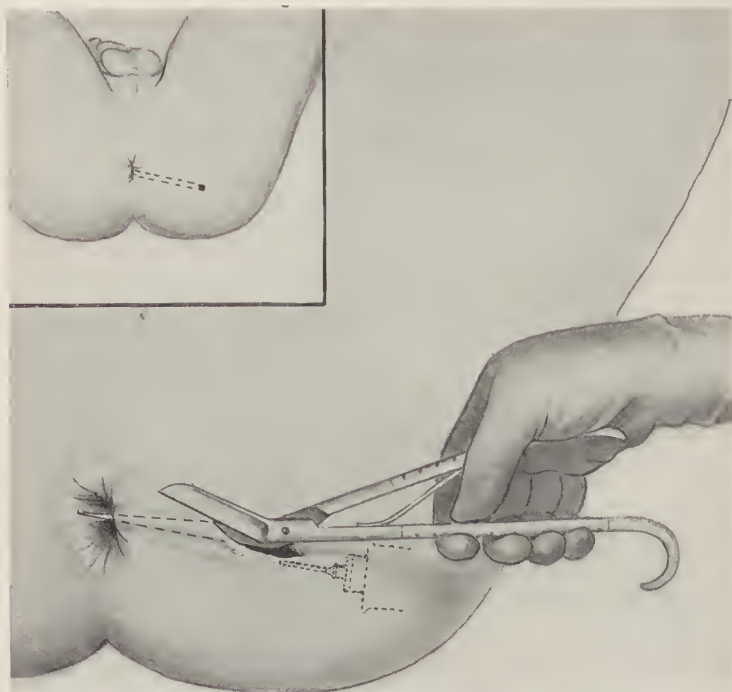


Fig. 256.—Method of employing author's fistula scissors in complete fistula operations. The insert shows the type of fistula best suited for the probed scissors operation performed under local anesthesia.

covered with a firm pad held snugly in place by a well-adjusted T-binder crossed over the author's pyramidal pad (Fig. 346) to arrest and prevent subsequent bleeding. Pain induced by pulling on the upper end of the director as it is withdrawn from the rectum is avoided by discarding the director and dividing the sinus with the author's probe-pointed scissors (Fig. 256).

Tension pain is also prevented in local anesthesia operations by incising the sinus up to the sphincter, introducing the author's curved fenestrated director, and cutting the muscles after the



manner shown in the accompanying illustration (Fig. 258) without withdrawing the internal end of the instrument.

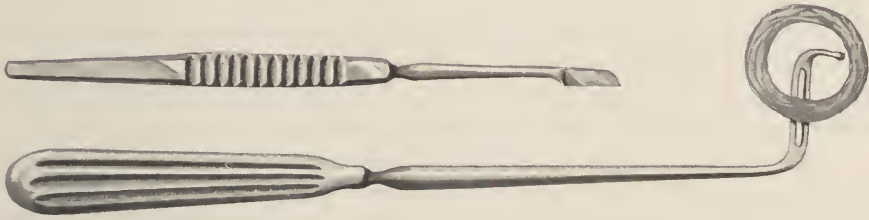


Fig. 257.—Author's curved fenestrated grooved director and knife employed in painless local anesthesia fistula operations.

Where there are multiple sinuses and openings, to avoid cutting the sphincter more than once outlying tracts are laid open in turn up to the fistula, entering the rectum posteriorly at the sphincteric juncture, which is then divided in the usual way (Fig. 253).

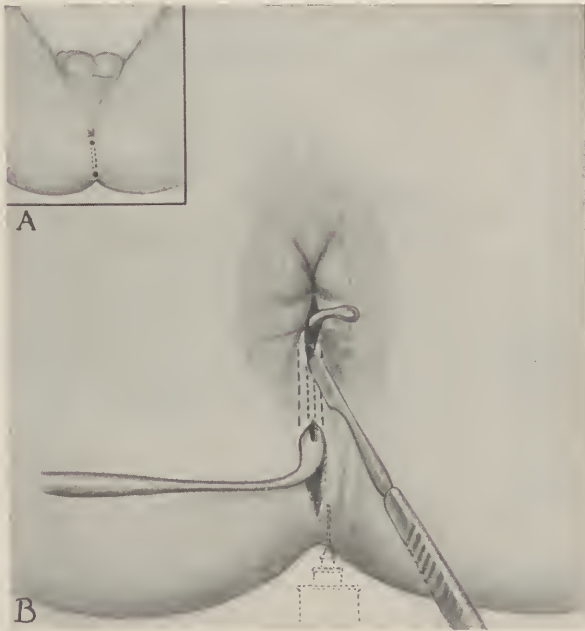


Fig. 258.—Technic of painlessly incising complete fistula under local anesthesia: Insert *A* shows type of the fistula being incised; *B*, when the author's special knife and curved fenestrated grooved director are employed.

When fistulae are deep or surrounded by considerable inflammatory or dense scar tissue large long steel probe-pointed groove directors (Fig. 254) are substituted for copper or brass instruments,

which *bend out of shape* when tension is made on them, and frail knives are not employed, since they frequently break and injure operator or patient.

Lengthy tortuous branching fistulæ are incised step by step without attempting to bring the director end out through the anus that they may be carefully traced and dealt with. In these cases *injecting tracts with bismuth paste* or *staining solution* assists the operator in defining them when otherwise difficult to locate.

In extensive deep burrowing fistulæ complicated by an extensive fibrous tissue deposit, when the upper end of the director

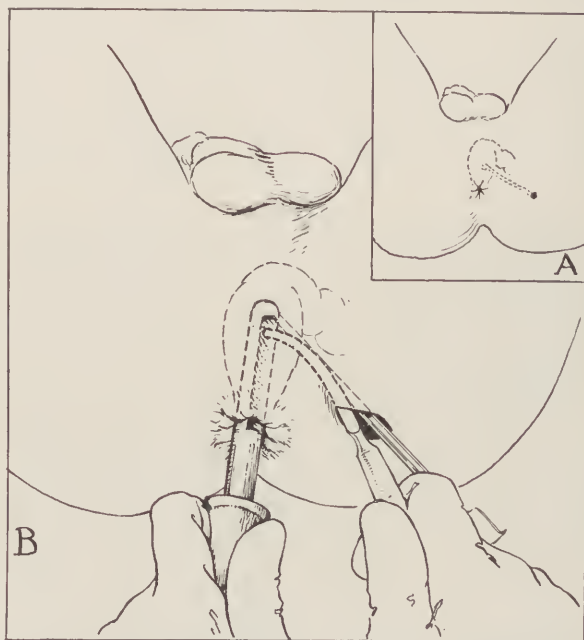


Fig. 259.—Long, deep, indurated fistula: Insert *A* shows variety and direction of the sinus being divided (*B*) with gorget and knife in a case where the rectal opening was high and end of the director could not be withdrawn through the anus.

cannot be withdrawn from the rectum, and the step-by-step operation is impracticable, a *wooden gorget* (Fig. 259) is introduced into the bowel, following which a strong knife guided by the director is pushed along the sinus until it impinges on the gorget, when both are simultaneously withdrawn, severing all intervening tissue (Fig. 259).

In fistula operations care is exercised when introducing probes and directors, otherwise the tract may be ruptured, misleading the operator as to the direction and extent of the sinus.

Except for exploratory purposes *divulsion* of the sphincter is unnecessary since the muscle is usually severed and put at rest by the operation. Elaborate preparation of the patient with cathartics, colonic irrigations, shaving the buttocks, or antiseptic applications are not required because wounds are left open, drain freely, healing takes place by granulation, and infection rarely occurs when the division operation is properly performed and postoperative treatment is intelligently carried out.

The author does not resort to the two-stage operation in extensive or complex fistulæ unless the patient suffers from pulmonary

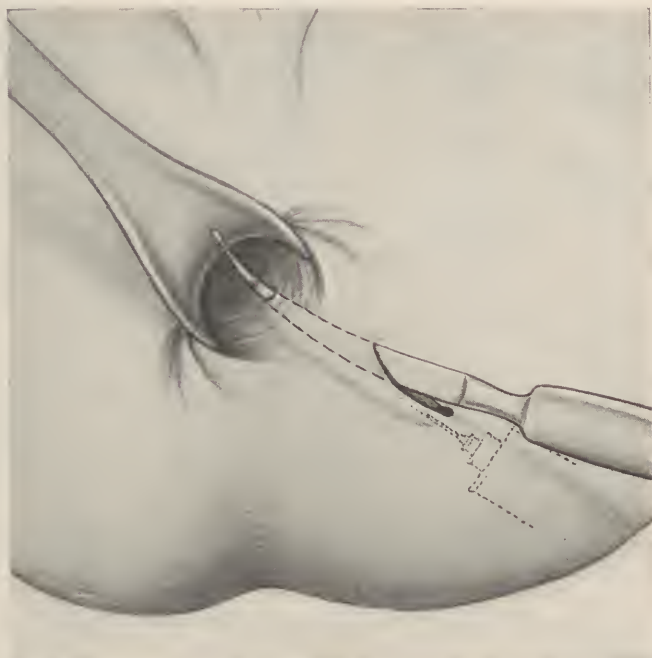


Fig. 260.—Division of complete submucocutaneous fistula with the author's fistula knife under local anaesthesia.

tuberculosis or wasting disease, and does not have sufficient vitality to heal an extensive wound.

Division with a *Paquelin cautery* (Fig. 286) is undesirable except when fistulæ are *tubercular* and closing of lymph-channels is necessary to prevent extension of the tubercular process to the joints, lungs, or other organs, since cauterization causes severe pain and delays healing, which does not begin until burned tissues have sloughed away. In doubtful cases in the absence of a cautery the incised wound is swabbed with carbolic acid and alcohol.

Some surgeons employ the chain-saw, enterotome, or *écraseur* in dividing fibrous and deep burrowing tracts, but the author has not found them necessary, and prefers the above plan. When in complex fistula there are many branches and openings and tracts are located on different levels—tiers (Fig. 241)—superficial sinuses are laid open, following which connecting tracts and deeper fistulæ are incised one after the other.

*Severing the sphincter* is avoided (Fig. 260) in the division operation for *submucous* and *subcutaneous* fistulæ, which are quite frequent, because they run over and not under or through the mucosa.

Lengthy sinuses tracking beneath the mucosa bleed profusely when divided, and it is advisable to tightly plug the wound with gauze to prevent subsequent hemorrhage, but oozing from skin incisions is quickly controlled by pressure pads held firmly in place by a T-binder, since unimportant vessels are severed.



Fig. 261.—Author's angular grooved director employed in blind internal fistula operations where the sinus passes downward beneath the sphincter.

The technic of incising *blind internal* varies slightly from that of *complete fistula* since there is no external outlet to guide one.

Following infiltration of tract and muscle with the anesthetic divulsion of the sphincter and exposure of the opening through the window of an anoscope or speculum (Fig. 260) the sinus is incised. When the fistula tracks up the rectum a straight grooved director is introduced to its upper extremity and forced into the rectum, following which overlying mucous membrane is divided (Fig. 260).

Blind internal fistulæ traveling downward, over, or beneath the anal muscle are difficult to locate. In such cases where feasible the author exposes the opening with a speculum, introduces his angular grooved director (Fig. 261), and draws it downward until



the end impinges against the integument. The skin is then incised and the instrument is brought outside and left lying across the anus, while tissues resting upon it are being incised (Figs. 261, 262). When the rectal opening cannot be found, blind internal fistulæ are located by palpation as indurated tubes and cut down upon externally. A grooved director is then introduced through the opening and directed upward until the end enters the rectum,

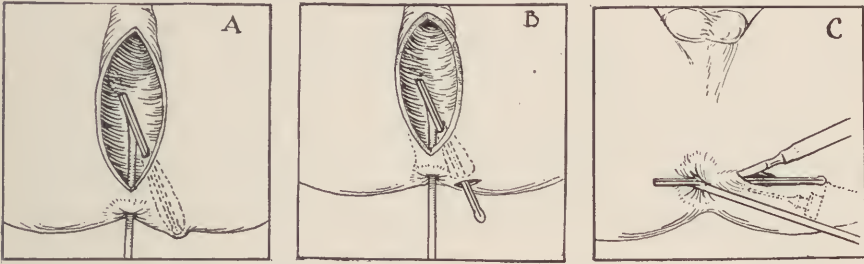


Fig. 262.—Steps in author's local anesthesia operation for blind internal fistula where his angular grooved director (Fig. 261) is employed, as shown in steps *A*, *B*, and *C*.

when it is caught by the finger, brought outside, and the sinus divided in the usual way.

Blind internal, tortuous, and corkscrew fistulæ that wind in and about the sphincter are traced and incised step by step until their distal extremities are reached and divided.

Multiple are operated upon in the same manner as single blind internal fistulæ and, preferably, at one time rather than by the two-stage plan.

## Chapter XXIII

### Anorectal Fistula (*Continued*)

#### SURGICAL TREATMENT

EXCISION OPERATION—FISTULECTOMY, LIGATURE OPERATION, SETON OPERATION, COMPLICATIONS, POSTOPERATIVE TREATMENT

**Excision—Fistulectomy.**—The excision operation for fistula appeals to surgeons and patients because when successful it causes slight pain, frequent dressings are unnecessary, and convalescence is shorter than when the sinus is incised and allowed to heal by granulation.

The procedure seems rational, but experienced proctologists and surgeons prefer the division operation, which is more reliable. The author has successfully excised and speedily cured many superficial short and long straight sinuses, but in a number of other cases similarly operated the procedure failed.

This operation is inadvisable when the patient is run down, suffers from pulmonary tuberculosis, or the sinus is primarily tubercular, and is not suitable for blind internal, blind external, submucous, deep burrowing horseshoe, complicated, rectovesical, rectolabial, rectovaginal, recto-urethral or submucous fistula tracts resulting from infection of Bartholin's gland. Excision is also impracticable when the sinus discharges freely, is connected with an acute abscess or complicated by sacrococcygeal necrosis, coloproctitis, ulcerated hemorrhoids, infected fissure, and crypts or other anorectal lesions, accompanied by a discharge.

The rule of *no stitching* in anorectal work holds as well for fistula as for other operations in this region. Nevertheless, owing to improved technic more fistulæ are being cured by excision now than formerly.

This procedure frequently shortens convalescence and brings good results when confined to the distal end of long tracts and branch sinuses where the rectal end of the main fistula has been incised, drained, and left to heal by granulation (Fig. 253).

Some surgeons claim fecal incontinence follows *excision* less often than the *division* operation because in the former sphincter ends are immediately sutured, while in the latter they are left apart and the wound is permitted to heal by granulation, but the

writer's experience does not harmonize with this conclusion, and he holds loss of sphincteric control is more liable to occur following excision because during operation sphincteric segments are sometimes removed.

The chief *disadvantages* of the excision operation are: it is unsuitable for many types of fistula, usually requires a general anesthetic, takes considerable time, is frequently complicated by infection, keeps the patient in bed longer, and results from it are not so good as following the division procedure.

When primary union is not obtained failure is usually due to activity of the anorectal muscles, infection, cutting out of stitches, or tearing open of the cut during the expulsion of hardened feces.

Stitch abscesses may not interfere with a cure, but when the entire wound becomes infected sutures are immediately severed to forestall extension of the infection, following which the wound is allowed to heal by granulation.

**Preparation.**—Patients are carefully prepared for excision by thoroughly emptying and cleansing and then tying the bowel up with an opiate to arrest peristalsis and prevent soiling the wound, shaving the buttocks, swabbing of the rectum and perianal skin with iodine, and taking other precautions that favor primary union.

Sims' is preferable for *local*, but the *lithotomy* posture is more convenient when fistula is to be removed under *general* anesthesia. Some operators inject the tract with bismuth paste or staining solution to identify it, but the author rarely finds this necessary, since a probe readily passes through sinuses suitable for excision, and fistula have been ruptured in this way, confusing the operation, owing to the escape of the bismuth or staining fluid into surrounding healthy tissues.

There are two methods of excising anorectal sinuses: (a) *extirpation of the tract, where the wound is left to heal by granulation*, and (b) *excision of the fistula with immediate approximation of wound edges and sphincteric ends*.

The author prefers the former, of which a technical description is unnecessary, since the steps in this are the same as in the excision operation except the wound is left open and drained.

**Technic of Excision with Immediate Approximation of Wound Edges and Sphincteric Ends.**—Briefly described the steps in this procedure as practised by the author are as follows:

*First Step.*—The steel probe (Fig. 264) of the author's fistula tractor (Fig. 263) is introduced and locked (Fig. 265) after overlying structures have been infiltrated with eucain until blanched (Fig. 264).

*Second Step.*—The sinus and internal opening are clearly defined by making tension upon the retractor (Fig. 265).

*Third Step.*—The external and internal ends of the tract including openings are freed by elliptic cuts joined by a mucocutaneous incision extending over and throughout the length of the fistula (Fig. 265).

*Fourth Step.*—While traction is made upon it the fistula is dissected free from within outward with knife or scissors.

*Fifth Step.*—Tension kangaroo, silkworm-gut or wire and buried chromicized catgut sutures are introduced (Fig. 265).

*Sixth Step.*—Following knotting of deep and approximation of the mucous and skin edges with plain gut sutures, wire tension stitches are adjusted.

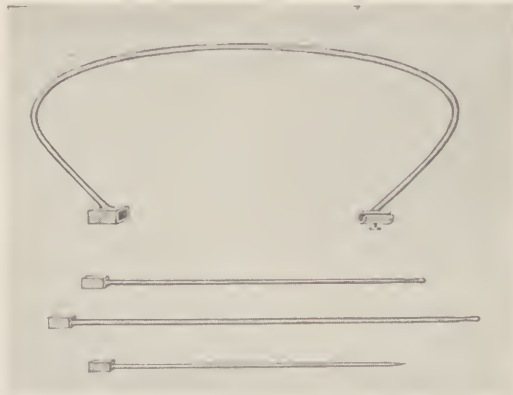


Fig. 263.—Author's firm steel fistula probes and retractor employed in his fistulectomy operation.

*Seventh Step.*—The wound is sealed with collodoin or dusted with aristol.

*Eighth Step.*—A protecting antisepticized gauze plug is inserted in the rectum, when the anus and adjacent buttocks are covered with gauze and cotton held in place by a firmly adjusted T-binder.

Branch sinuses are dissected out and closed like the main channel; when difficult to trace, a grooved director is introduced and tracts are slit open and then excised. Fistula wounds are never closed until hemorrhage has been controlled and all blood-clots have been removed.

Divulsion of the sphincter is advisable to procure additional room when the anal canal is tight, but is unnecessary when the patient has a patulous anus.

To minimize danger of infection deep and tension sutures



are passed around and beneath, but not *across the wound*, and are loosely tied to prevent their cutting out.

Infection follows excision less often when the mucous end of the incision is sutured to the right or left of the main cut or the rectal end of the wound is covered with a tongue-like flap of mucosa sutured to the outside skin (Fig. 265, *E*). Overhanging edges of skin or mucous membrane and all fibrous, indurated, and ragged tissue is removed before the wound is closed.

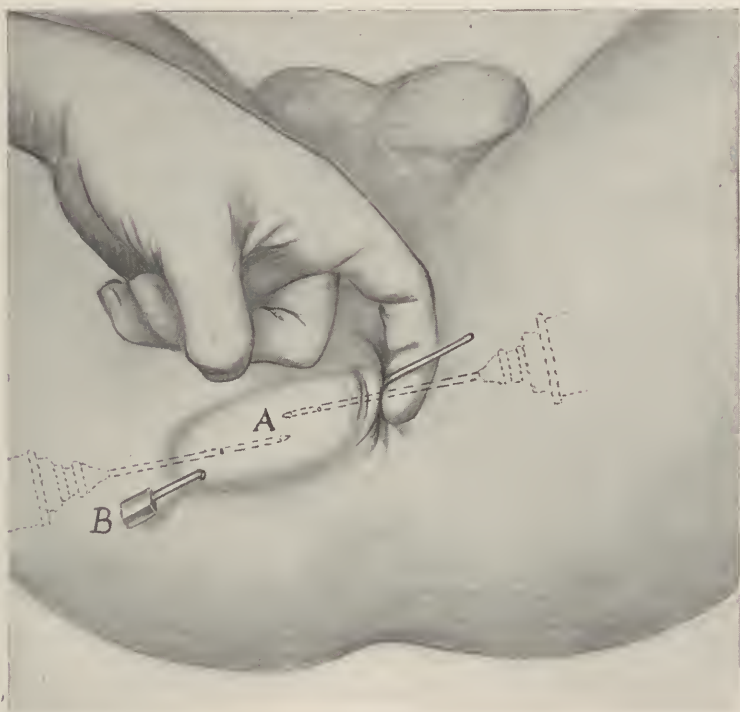


Fig. 264.—Preliminary step in author's local anesthesia fistulectomy: *A*, Overlying tissues anesthetized; *B*, steel probe introduced ready to be attached to the retractor.

When it is seen during operation that the wound must necessarily be very extensive, fresh pus-pockets are discovered, or the tract proves to be tubercular or cancerous, excision is abandoned for the division operation, which is safer and more reliable in all cases.

Where a Gant safety-pin retractor (Fig. 264) is not at hand, a long soft probe may be substituted by introducing it into the fistula and entwining the ends. Complicating anorectal diseases are operated before the sinus is excised.

The *postoperative* treatment is easier to carry out following excision than the division operation. It is advisable to keep the patient in bed on a fluid diet for a few days and to administer an opiate, preferably morphin, gr.  $\frac{1}{8}$  (0.008), hypodermically or in a

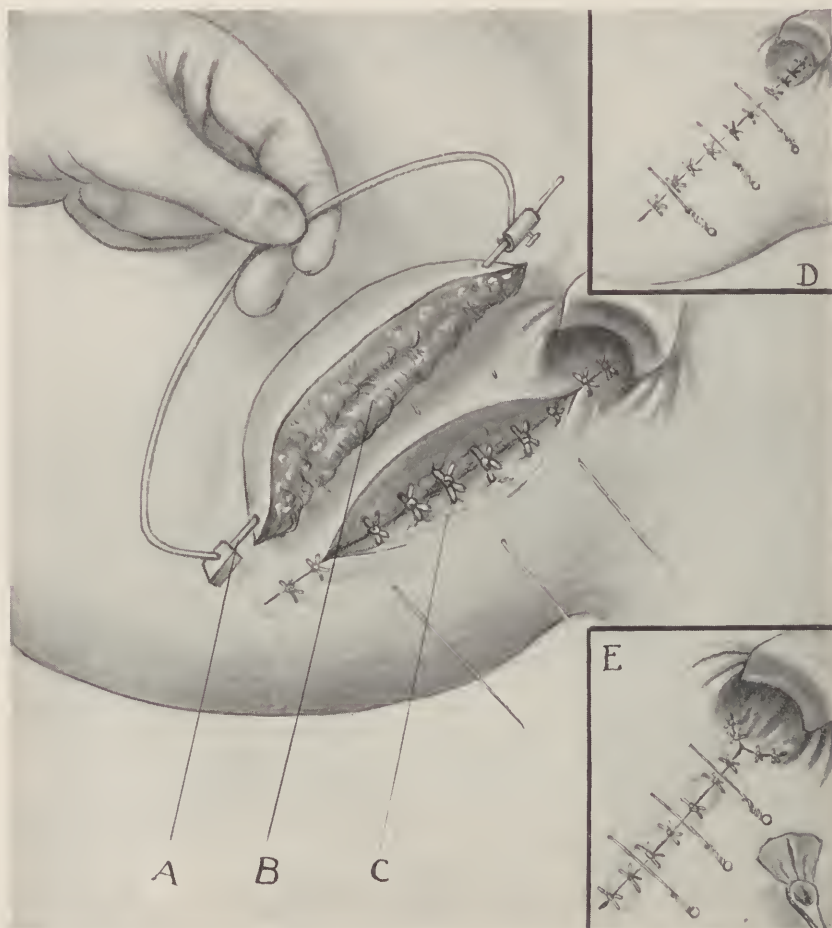


Fig. 265.—Steps in author's fistulectomy: *A*, Author's fistula retractor; *B*, excised sinus; *C*, superficial and deep sutures; *D*, wound closed and reinforced by wire sutures; *E*, the same as *D*, except mucosa is freed, brought down, and sutured to the skin to prevent infection of the rectal end of the wound.

suppository two or three times daily to lessen suffering and constipate the patient.

Some surgeons prescribe a laxative daily to procure loose evacuations, which is a mistake, since fluid feces get into and infect the wound. Where a movement has been deferred for several

days the bowel is cleared by a dose of castor oil or a warm emulsion—olive oil,  $\mathfrak{z}\text{iv}$  (120.0), and bismuth subnitrate,  $\mathfrak{z}\text{ij}$  (2.0)—injected into the rectum just before defecation. Following stool the lower rectum and wound are cleansed with an antiseptic solution and dried, after which the dressings are reapplied.

Unless evidences of infection are present the wound is not probed, but when there is continuous pain, high temperature, or pus appears the wound is infected and sutures are cut to provide for immediate drainage. When the entire suture line is involved all stitches are divided, cut edges are pulled apart, the wound is drained and left to heal by granulation, as in the division opera-

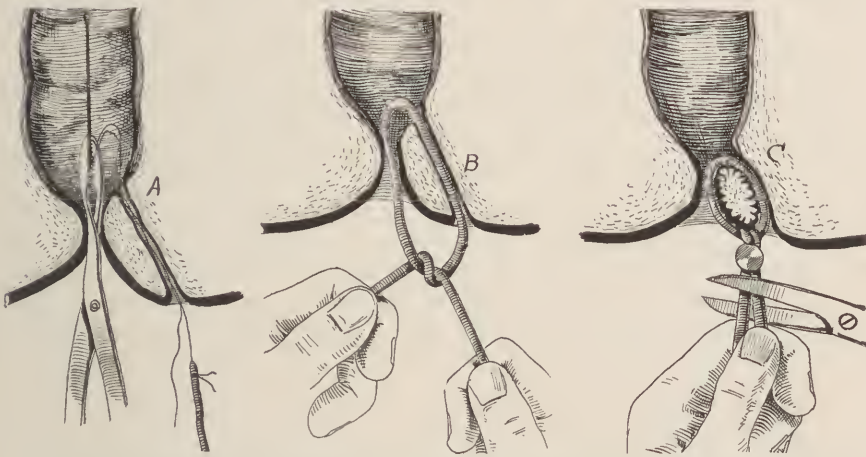


Fig. 266.—Ligature operation for fistula indicated only in tubercular subjects. Steps: A, Introducing; B, tying; C, removing the ligature after it has been tightly adjusted and ends fastened with a compressed split bullet.

tion; otherwise a portion of the wound heals, leaving a sinus beneath, necessitating a lengthy convalescence and second operation.

To prevent infection of the rectal end of fistula wounds Elting loosens the mucosa of the lower rectum as in Whitehead's hemorrhoidal operation and sutures it to the skin below the internal fistulous opening (Fig. 265, E).

To avoid sphincteric mutilation MacKenzie, through a *trap-door flap incision*, excises the fistula and its branches, and after stitching the rectal gap from within and without sutures the replaced flap.

**Ligature Operation.**—Before the advent of local anesthesia anorectal fistulæ were occasionally divided with ligatures after the manner shown in the accompanying illustration (Fig. 266),

but the method is now almost obsolete, having been discarded for the *division* and *excision* operations which are more reliable.

The ligature operation is regarded with favor by some physicians because *general anesthesia is unnecessary, a knife is not required, there is no bleeding, the patient is not confined to bed, and the operation is not very painful*; and advocates of the procedure claim there is less danger of incontinence than following division and excision operations, but this is untrue, since the sphincter is severed in either case.

Before he began operating under local anesthesia the author occasionally ligated tubercular and ordinary fistulæ in patients suffering from pulmonary tuberculosis to avoid irritating the lungs with ether and permit the sufferer to remain in the fresh air instead of a hospital.

The ligature possesses no advantages over the division and excision operations performed under local anesthesia, and is never performed by the author except when the patient insists, because it is unsuitable for *horseshoe, perirectal, recto-urethral, rectovesical, rectovaginal, and sinuses that are long, tortuous, deep, or branch, and it frequently fails to cure, the ligature does not always cut through the tissues, and the operation must be finished with scissors; it induces prolonged pain or discomfort, the ligature becomes filthy, causing infection, irritation, or abscess, and requires weeks to accomplish what can be painlessly done with the knife in a moment under local anesthesia.*

**Author's Technic.**—A soft-rubber, silk, or linen ligature attached to a probe will serve the purpose; the probe is passed through the tract until its distal end enters the rectum, where it is caught with the finger and brought outside, bringing the thread and attached ligature with it. The bridge of tissue along the fistula is then infiltrated with a  $\frac{1}{8}$  per cent. eucain solution, after which the rubber ligature is tightly tied, which causes intense pain during and subsequent to the operation unless the tissues have been anesthetized (Fig. 266, *A, B, C*).

The ligature supposedly stimulates healthy granulation and healing of the wound as it cuts out, but frequently a deep ragged sulcus is left that requires a long time to heal, or remains, to cause fecal incontinence.

The author has known troublesome hemorrhage from sloughing and has treated a patient for fecal incontinence caused by the ligature operation. The length and strength of the ligature—rubber, linen, or silk—is varied in accordance with extent, depth, and density of the sinus and tissues to be severed.



In ordinary fistulæ elastic ligatures cut out in from three to six days, but where the tract is deep and fibrous one or two weeks may be required. Sometimes it is necessary to introduce a second ligature or divide unsevered tissue with a knife to complete the operation.

Following ligation the wound is syringed daily to prevent itching, discomfort, and infection, and when the ligature incites sphincteralgia or contraction of the levator ani muscle an occasional suppository containing morphin or cocain, gr.  $\frac{1}{8}$  (0.065), and extract of belladonna, gr.  $\frac{1}{4}$  (0.016), is prescribed to allay pain.

Wounds caused by sloughing ligatures are daily cleansed, dried, drained, and stimulated with ichthyol or silver when healing is sluggish.

**Seton Operation.**—Ancient surgeons carried a silk thread—*seton*—through the fistula and tied the ends loosely, expecting it to gradually divide the sinus by ulceration instead of strangulation, a procedure almost discarded by modern surgeons because the thread is irritating, gets filthy, requires weeks or months to cut its way out, and is useless in complicated and extensive cases of anorectal fistula. The author resorts to this procedure only in deplorable fistulæ *inoperable with knife or scissors*, and cases in which the patient is greatly *debilitated* by pulmonary tuberculosis, anemia, etc., and could not withstand an extensive cutting operation.

**Postoperative Treatment.**—Success following the division operation for fistula depends as much on after-care of the wound as the surgeon's technic. The author cures practically all private patients, and where failure has followed laying open of the sinus postoperative treatment has usually been left in the hands of an inexperienced family physician, nurse, or intern.

At completion of the operation the cut is tightly plugged to arrest and prevent hemorrhage, but thereafter the wound is *loosely drained* with a strip of gauze. Arrested healing and fecal incontinence is most often traceable to *daily firm packing of the wound* which destroys healthy granulations, leading to the formation of a *sulcus*, the point of leakage when the wound is finally covered by mucosa and skin.

Following abscess and acute fistula operations where there is cellulitis or necrotic tissue and free discharge a *wet dressing* of cotton moistened in a boric acid or Dakin solution is kept in the wound until the inflammatory process subsides and pus diminishes.

After thirty-six hours the author lets his fistula patients get out of bed, places them on a full diet, and endeavors to procure

daily soft-formed evacuations by the administration of olive oil, a dinner pill, *Les Fruit*, or other mild laxative.

*Tying the bowel up* with an opiate is objectionable because later the incision is traumatized during expulsion of scybala or firm large fecal masses, and *liquefying feces* procured through the administration of saline mineral water and cathartics is not desirable, since they become pocketed and invite infection, cause burning pain, soil dressings, and are responsible for frequent painful stools.

Formerly the author kept patients in bed for days, weeks, or months following fistula operations, believing healing would not take place unless they were given complete rest, but experience has demonstrated that confinement to bed or the house for more than a few days, except in aggravated cases, is unnecessary, when daily dressings are properly made in the home or office.

Unless the patient prefers the hospital, *submucous* and *subcutaneous* fistulae are operated in the clinic or office under local anesthesia, and he is permitted to go home or to work after bleeding has been arrested and morphin has been administered to control temporary postoperative pain.

Following division of moderately deep sinuses the patient is kept in bed two or three days to forestall possible hemorrhage and make him comfortable, but where the tract is very extensive, complicated, or acutely inflamed he is confined to the house or hospital for a few days or until he can come to the office for the dressings.

Fistula wounds are dressed once or twice daily at first, and then from one to three times weekly, according to indications, for healing ceases as soon as gauze and cotton become saturated with pus. The discharge is most abundant shortly following operation and diminishes as the wound heals. When dressings suddenly become soaked with foul-smelling, thick yellow pus infection has taken place and a new abscess has formed that should immediately be freely incised and drained.

Rectal *irrigation* causes pain, often stimulates an evacuation, and the solution escapes and soils fresh dressings, adding to the patient's discomfort, and instead the author cleanses and dries the wound, using cotton attached to a wooden throat applicator.

Infection never occurs when *pocketing* and *bridging* of the wound (Fig. 267) are prevented, hence antiseptics have no advantage over warm water as a cleansing medium. Peroxid of hydrogen is particularly objectionable because when continuously employed daily it indefinitely postpones healing by destroying granulations.

Freely drained wounds progress favorably and do not require stimulation except when the patient's vitality is low, the sinus is tubercular, or soft fungous granulations—proud flesh—form; hence frequent cauterization of fresh and older fistula wounds with stick silver, copper, or the cautery is a pernicious practice, since it causes excruciating pain, slows up or arrests the healing process, and often leads to fecal incontinence by preventing union of sphincter ends through the destruction of newly formed tissues.

Such agents are occasionally employed to destroy exuberant, soft, spongy, or abnormal granulations that project beyond the surrounding healthy tissue, but silver nitrate 6, ichthyol 15, or balsam of Peru 20 per cent. are substituted for them when the wound



Fig. 267.—Probe inserted beneath bridge of tissue in a partially healed extensive fistula wound which would have caused failure had it not been promptly incised under local anesthesia.



Fig. 268.—Sinus overlooked by a surgeon when operating for an extensive complex fistula which accounted for failure of the operation.

is sluggish and requires mild stimulation. Methylene-blue (10 per cent.) applications almost immediately dry up sensitive wounds bathed in pus and allay discomfort from the discharge.

*Keeping the cut dry, providing free drainage, prescribing a nourishing diet, and regulating the stools, next to preventing the formation of pockets in and bridging over of the wound, are the essential factors in the postoperative treatment of fistula.*

The skin or mucous membrane is trimmed off when it shows a tendency to overlap the wound, for when either grows deeply into the cut drainage is interfered with and fecal incontinence may follow healing, when sphincter ends are prevented from uniting.

Sphincteric control is partially or completely lost shortly



following extensive fistula operations, but is usually regained before the wound completely heals.

*Frequent probing and examination* of the cut with the finger delays healing and often leads to wound infection. Where convalescence is prolonged healing is arrested or the patient subsequently suffers from fecal incontinence, the patient is examined for heart or lung complications, diabetes, alcoholism, or Bright's disease, conditions known to have arrested or delayed healing.

Where the wound is healthy, properly handled, and the fistula is not cured, the probabilities are that a section of the main or a branch sinus (Fig. 268) has been overlooked.

#### **Complications During and Following Fistula Operations.—**

*Soiling* the operative field by feces is a frequent and annoying complication, but such accidents are avoided when the patient has been prepared in the manner outlined, and when fluid feces repeatedly interfere with the operator they are eliminated by stripping the sigmoid flexure, rectal irrigation, and cotton swabs.

**Bleeding** may be copious, but dangerous *hemorrhage* is seldom encountered during or following excision or incision of the fistulous tracts. Immediate bleeding is arrested by hot-water compresses packed in the wound and ligation of spurting vessels. In most instances hemorrhage ceases before operation is completed, and time is not wasted in attempts to control it before the wound is packed and the binder is applied unless a large vessel is injured.

At completion of the operation or later where bleeding takes place from an oozing area or spurting vessel located high up, not arrested by packing, it is controlled by clamping the artery, vein, or tissue with the author's pressure forceps left *in situ* following removal of the detachable handles (Fig. 549).

The reader is referred to Chapter XXXVI for a full description of different methods of managing hemorrhage incident to fistula and other anorectal operations.

**Shock.**—Surgical shock seldom results from fistula operations because they last only a few moments and little blood is lost when the work is properly done by an experienced surgeon. Hypodermoclysis or intravenous infusion with stimulation are employed when this complication arises after bleeding has been controlled.

**Sepsis.**—Fistula wounds seldom become infected unless they are infrequently dressed, permitted to bridge over, become pocketed, skin end of the incision has been allowed to come together, or the tract has been excised and sutured. When infection occurs the patient complains of localized pain and fever, shortly followed by the appearance of foul-smelling, thick yellow pus. In such



cases the patient's discomfort continues and healing of the wound is arrested until the newly formed small or large abscess has been located, incised, cleansed, and drained.

**Retention of Urine.**—Occasionally, as the result of tight packing or contractions of the levator ani muscle, the patient is unable to void his urine. When the trouble is due to the former, and replacing the gauze plug with a light dressing does not bring relief, an electric pad or hot-water bottle continuously applied over the buttocks usually soothes and causes the irritable muscle to relax; but when it does not, morphin, gr.  $\frac{1}{8}$  (0.008), belladonna extract, gr.  $\frac{1}{4}$  (0.016), administered by mouth or in a suppository, relieve pain and difficult urination.

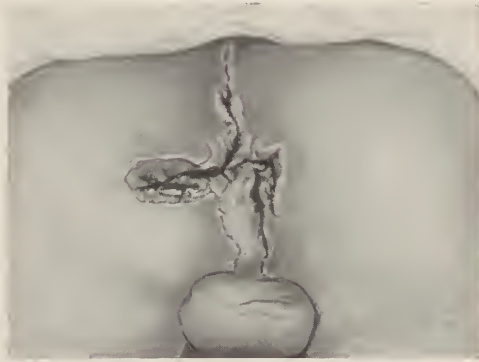


Fig. 269.—Scars from partially healed wound made for extensive complex fistula extending around the bowel and from the sacrum to the scrotum. The sinus opened into the rectum at two points, one posteriorly 2 inches above, and the other anteriorly, near the anus or sphincteric juncture.

**Cicatricial Tissue.**—Scar tissue forms about the anus or buttocks following nearly all extensive fistula operations (Fig. 269), and where multiple operations have been performed cicatricial tissue is abundant and scars radiating in all directions distort the parts and interfere with the excision or division of unhealed tracts. The deformity which interferes with anorectal circulation and contraction of the sphincter muscle is corrected as far as possible by dissecting out the cicatricial tissue about the fistula, when it is divided, excision being impracticable.

**Postoperative Pain and Sensitiveness.**—Sometimes following the cure of complicated fistulæ the patient complains of pain while sitting, walking, and during defecation caused by an irritable mucosa, scars, or entangled nerves. Sensitiveness from rectal irritability is overcome by nightly injections of ichthyol 2, hydrastis

5 per cent., or few ounces of an emulsion composed of olive oil,  $\text{℥ij}$  (60.0), and bismuth subnitrate,  $\text{℥j}$  (2.0).

When annoyance from scars does not gradually subside as tissues soften, cicatricial ridges causing discomfort are incised or removed with scissors under local anesthesia.

Itching, tingling sensations, and pain resulting from tying up of a nerve by scars is relieved by dissecting away offending cicatricial tissue and releasing the nerve.

**Stricture** of anus or rectum is an occasional sequel of extensive multiple fistula operations. Constipation, straining, and discomfort from this source are speedily alleviated by incising the strictured bowel and occasionally stretching the rectum with the fingers or a No. 12 Wales bougie.



Fig. 270.—Appearance of anus and cicatrices in a case of partial fecal incontinence that followed healing of a complex fistula.

**Fecal Incontinence.**—Loss of sphincteric control (Fig. 270) is the most frequent and serious complication of fistula operations. Division of long or tortuous, deep fistulous tracts is temporarily followed by involuntary movements, but incontinence usually subsides when the wound heals and the intervening space between sphincter ends has filled in.

Partial or complete permanent incontinence (see Chapter XXVI) is seldom encountered by the expert in fistula operations, but frequently occurs following operations performed by inexperienced surgeons having a poor technic and little knowledge concerning the postoperative treatment of fistula wounds. The reader is referred to Chapter XXVI for a discussion of the methods of preventing and curing fecal incontinence resulting from operations and other causes.

## Chapter XXIV

### Special Types of Anorectal Fistula

RECTOVAGINAL, RECTOLABIAL, RECTOVULVAR, RECTOVESICAL, RECTO-  
URETHRAL, RECTOSACRAL, RECTOCOCCYGEAL, BARTHOLIN'S  
GLAND, SUBMUCOUS

**Etiology, Pathology, Symptoms, Diagnosis, Treatment.**—Having completed the study of *ordinary* sinuses the author will devote this chapter to a discussion of *special types* of fistula, the majority of which connect the rectum with some other organ.

**Rectovaginal Fistulæ.**—Here there is a communication between the rectum and vagina by a direct or tortuous sinus. Rectovaginal fistula (Fig. 271) is occasionally encountered and may be caused by Bartholin's gland infection, injury to the bowel during labor, imperfect perineorrhaphy, extensive ulceration, stricture, cancer, perianal tuberculosis, sloughing subsequent to hemorrhoidal and other operations performed on the bowel or vagina, congenital defects, penetrating injuries, and pressure from pessaries.

Usually the tract passes from the rectal opening located in the anterior median line  $\frac{1}{2}$  inch (12.7 mm.) above the anus directly into the vagina or labia.

Fistulæ secondary to abscess in one or both Bartholin's glands (Fig. 217) may discharge through multiple vaginal or labial apertures or pass downward beside the bowel and enter the lower rectum at the usual site. Rectal and vaginal openings are not on the same level and the former are usually larger than the latter.

**Symptoms.**—Patients afflicted with rectovaginal fistula complain of gas or feces escaping through the vagina when the opening is large, but when the sinus is small **diagnosis** is based on the rectovaginal discharge, excoriation of mucosa and skin, sphincteric irritability, and detecting the fistulous opening with the finger by inspection through a speculum or anoscope or by palpation and probing. The fistula lining may be composed of mucosa, fibrous tissue, or covered with granulations. When fistula is secondary to cancer or stricture the openings may be high or low and are located above and below the obstruction.

**Treatment.**—The treatment of rectovaginal fistula may be simple or complicated; fistulæ are sometimes closed by Paquelin or

electric cauterization or applications of chlorid of zinc or silver nitrate. When the sinus passes through the lower segment of perineum or over it beneath the skin it is cured by *incising* tissues down to the tract, which is permitted to heal by granulation.

The author has cured many rectovaginal fistulæ by incising the anus under local anesthesia (Fig. 271) and permitting the wound to heal by granulation and *freshening and suturing openings* following *cauterization or curetage* of the *intervening sinus*, and has healed others by *excising* the tract, approximating wound edges with



Fig. 271.—Technic of operating upon complete rectovaginal fistula under local anesthesia

chromic and plain gut reinforced by wire sutures (Fig. 272, *A*, *B*, *C*, *D*).

Where fistula has been excised through a perineal wound a flap of mucous membrane is loosened, brought down, and sutured outside the anal margin to protect the wound from infection by feces (Fig. 272, *D*).

In case fistula openings have simply been freshened and sutured, mucous membrane of the rectum is freed and drawn downward or to one side, so that the rectal is not on a line with the vaginal opening, which minimizes danger from infection (Fig. 272, *C*).

In a few instances after having enucleated the tract the rectal



opening was left to heal by granulation. It is advisable to divulse the sphincter in all operations for rectovaginal fistula to diminish sphincteric activity and facilitate defecation.

Danger from infection is minimized by leaving a gauze-covered rubber tube in the rectum, keeping the patient on fluids, and delay-

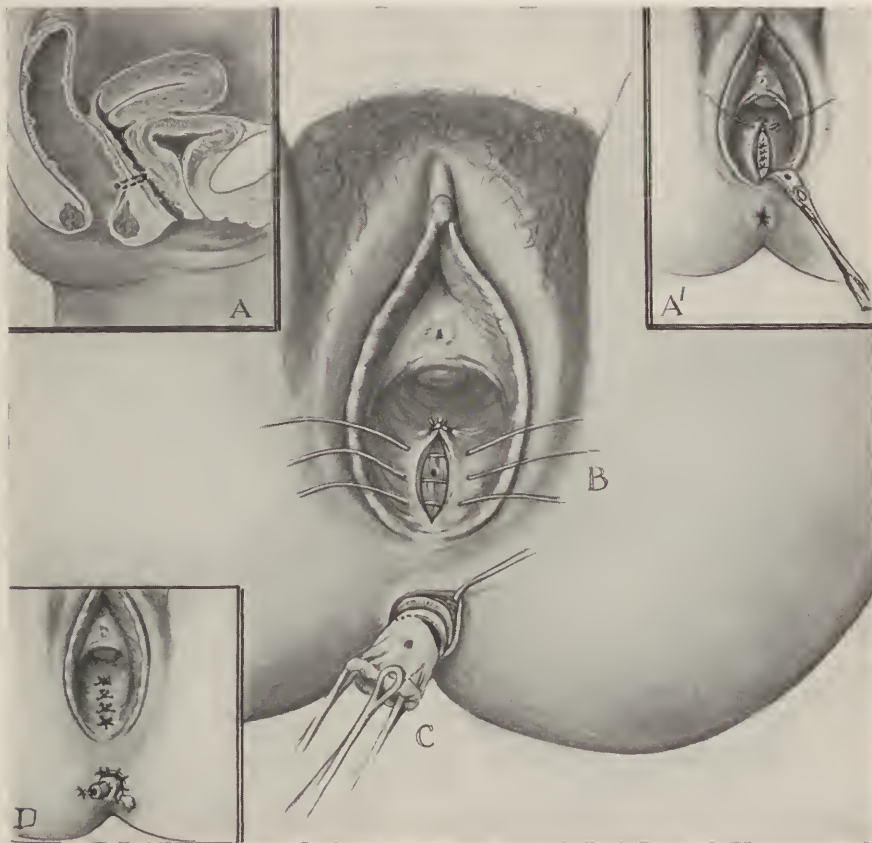


Fig. 272.—Author's methods of closing rectovaginal fistula: *A*, Fistula; *A'*, openings in vaginal septum and rectal wall excised by an elliptic incision and wound closed by separate suture lines; *B*, vaginal aperture removed and septum closed over rectal opening; *C*, rectal mucosa with opening brought down and amputated to prevent rectal infection; *D*, vaginal wound closed, mucosa sutured to perianal skin, drain inserted, and large rubber tube introduced into the bowel to facilitate evacuation of gas and feces and protect the wound.

ing movements until the wound is partially healed. Preferably feces are removed with oil enemata, cathartics being objectionable, since they liquefy feces and increase danger from infection.

Colostomy is not justified in aggravated cases when other procedures fail, because the patient would rather have feces evacuated through the vagina than an artificial anus in the abdomen.

**Rectovulvar—Labial—Fistula.**—Fistula joining the vulva and rectum are occasionally met with, the result of injury during labor, accidental injuries, vaginal operations, infection of the labial glands, or rectal ulceration. There may be single or multiple openings in the vulva connected with the rectum or each other, beneath the mucosa, superficial fascia, or skin (Fig. 273, *A*).

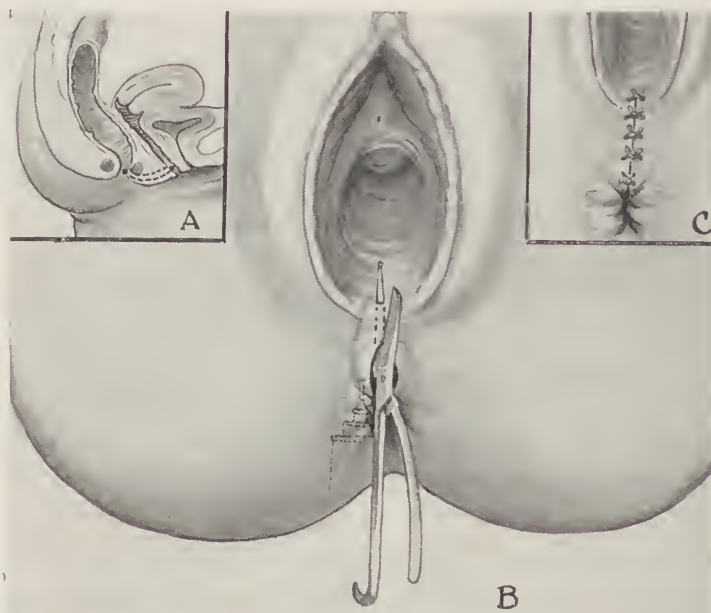


Fig. 273.—Rectovulvar fistula operated with author's probe-pointed fistula scissors: *A*, Fistula; *B*, sinus being divided with scissors; *C*, wound sutured with catgut.

Routine treatment is impracticable, since these sinuses vary, and in a series of cases they are best treated by cauterization, excision, or division (Fig. 273, *B*).

Rectolabial and rectovulvar are treated upon lines similar to those employed in curing rectovaginal fistula outlined above.

**Rectovesical and Enterovesical Fistula.**—When there is a communication between bowel and bladder it is designated *rectovesical* (Fig. 274) or *enterovesical* fistula according to the segment of gut involved. In 50 per cent. of cases the tract connects the rectum and bladder (Fig. 275) in enterovesical fistulæ, the opening is in the sigmoid twice as often as in the small intestine, and vesico-colonic and vesicocecal sinuses have been rarely encountered.

Of Cunningham's 342 collected cases of enterovesical and rectovesical fistulæ, 75 per cent. were females and 25 per cent. males.

Rectovesical fistula is generally serious because sooner or later dangerous cystitis ensues, the kidneys become infected, or a difficult operation is required to heal the sinus and cure the disease causing it.

Rectovesical fistula has been induced by surgical traumatism, diverticulitis (Fig. 275, *A*), ulcerative colitis, cancer, actinomycosis, bilharziasis of bladder or rectum, superior pelvirectal and prostatic abscesses, urinary calculi, careless introduction of the sound, cystoscope, or enema tube, and rectal instrumentation, rectosigmoidal diverticulitis, crushing of vesical calculi, penetrating wounds,

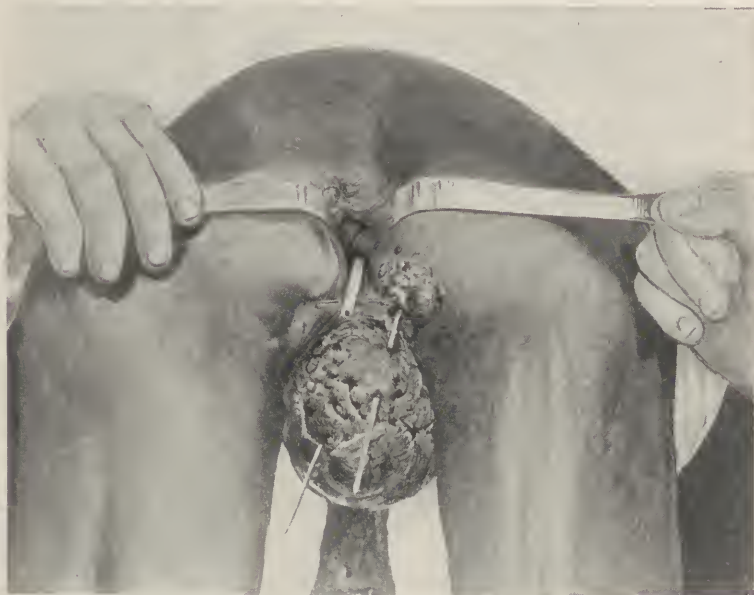


Fig. 274.—Multiple abscess and fistulae involving the bladder, rectum, buttocks, and scrotum caused by rupture of the urethra and extravasation of urine into surrounding structures.

rupture of the bladder from kicks, falls or distention, tapping the bladder through the rectum, vesical or rectal tuberculosis, stricture of bowel with ulceration, disease of the uterus, tubes, ovaries or prostate, abdominal abscess, matting together of rectum and bladder by inflammatory, suppurative, or malignant affections of the rectum, bladder, or abdomen.

The author has treated 6 cases of vesicosigmoidal fistula: induced by cancer of the sigmoid, 2; vesical tuberculosis, 1; sigmoidal diverticulitis, 1; tubal pelvic abscess, 1; superior pelvic abscess, 1; 13 cases of rectovesical fistula the result of large urinary calculi, 2

(Fig. 686); injury to the bladder and rectum by impact of wagon tongue, 1; superior pelvirectal abscess, 3; rectal carcinoma, 1; vesical tuberculosis, 1; crushing urinary calculus, 1; perineal excision 1; prostatectomy, 1; rectal stricture complicated by extensive ulceration, 1.

**Symptoms.**—Patients afflicted with rectovesical fistula suffer considerably because urine constantly drains into and out of the

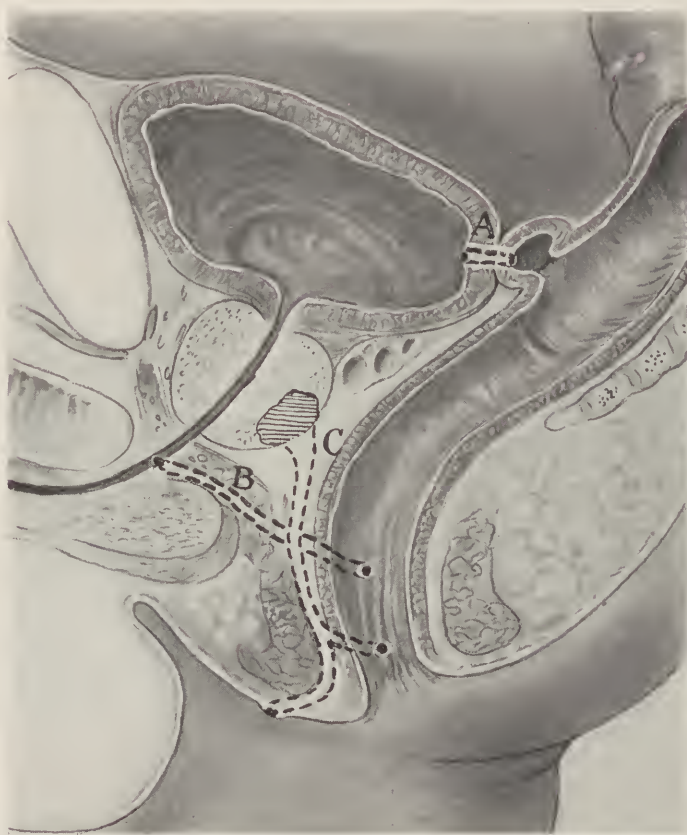


Fig. 275.—Special types of fistula: *A*, Rectovesical, caused by diverticulitis, *B*, recto-urethral; *C*, prostatic.

rectum, causing burning pain and sphincteralgia and proctitis complicated by excoriation, ulceration, or sloughing of mucosa, and complain of a disagreeable urinary odor due to saturation of the skin and clothing with urine.

The escape of feces and gas into the bladder induces *cystitis* and *urethritis* and frequently *infection* extends to one or both *kidneys*. When the sinus is large gas and feces are voided through



urethra, causing distressing smarting pain or agonizing rectovesical tenesmus. Usually the anogluteal skin is inflamed due to dribbling of urine through the anus, and when the sphincter is irritable constipation and painful defecation are troublesome.

Suffering is greater when the rectal is higher than the vesical opening because feces more readily pass into the bladder.

**Diagnosis.**—Ordinarily entero- and rectovesical fistula are easily diagnosed because air bubbles appear in urine, gas escapes through the urethra, urine is voided per anum, and the patient suffers from suppurative cystitis, urethritis, and rectal irritability. When the opening is large some feces escape into the bladder, under which circumstances food residues are at times observed in the urine.

It is not difficult to differentiate between vesicorectal and urethrorectal fistula because in the former urine constantly drains into the rectum, and in the latter it escapes into the bowel during urination only.

Frequently the opening in the rectum or bladder is located by proctoscopic or cystoscopic examination, but when this is impossible a diagnosis is made by distending either organ with water, colored fluid, or gas to see where it escapes.

Diagnosis is *easy* when the vesicorectal fistula opening is large, for urine passes through the rectum and gas or feces escapes by way of the urethra, and *difficult* when the sinus is high, narrow and tortuous, and openings in the rectum and bladder are small and located on different levels. Vesical apertures are most often situated in the region of the trigone, but are occasionally found at the summit or posterior wall of the bladder.

**Prognosis.**—Spontaneous cures have occurred and rectovesical sinuses having small openings, where no feces reach the bladder, have been healed by opening, draining and irrigating the bladder, and making topical applications to the rectal end of the fistula, but, as a rule, the prognosis is grave in this class of cases. The majority die in two or three years, but some individuals become immune and survive rectovesical infection for years. Death in these cases is usually caused by cystitis, kidney complications, or exhaustion.

One cannot prognosticate whether an operation will terminate fatally or benefit the patient should he recover, because infection and failure of the wound to heal frequently follows this type of plastic work owing to frequent soiling of the wound and infection caused by urine and feces.

The rectum soon accommodates itself to the passage of urine

through it, but the bladder always resents feces, consequently the condition of patients afflicted with entero- or rectovesical fistula is greatly improved by an *artificial anus* that diverts feces from the bladder. The author cured one case of rectovesical fistula by colostomy and subsequent drainage of the bladder.

The prognosis depends on the lesion responsible for fistula, and is most unfavorable when it is caused by tuberculosis or cancer.

**Treatment.**—Failure to heal rectovesical sinuses by draining the bladder, irrigating the tract with astringent solutions, having

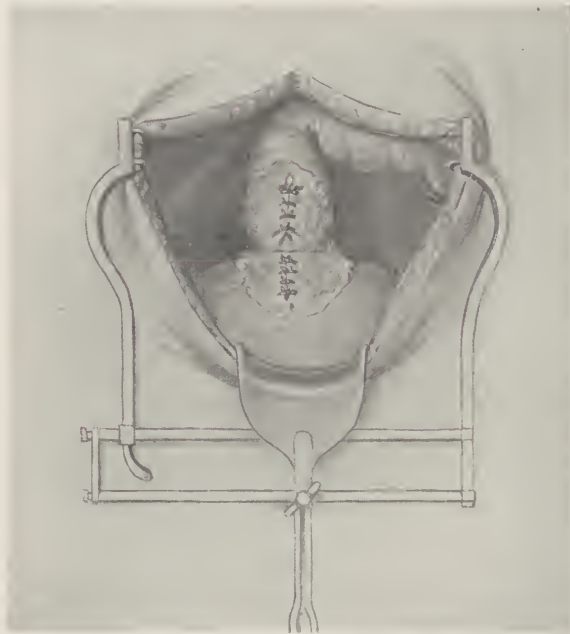


Fig. 276.—Operation for rectovesical fistula where the bladder opening is closed by *seromuscular sutures* and the rectal aperture is closed by *infolding sutures*. By pulling on the attached rubber tube (Fig. 277), introduced for the purpose the rectum is infolded which lessens the danger from infection and subsequent leakage.

the patient lie on his abdomen to drain urine away from the opening, and other palliative measures have demonstrated that rectovesical fistula is strictly a surgical condition.

Operative procedures are useless except when the disease that caused the sinus has been eliminated previous to an attempt at closure of the sinus.

A routine technic is impracticable because without laparotomy, a direct inspection of rectum and bladder, one cannot always determine the kind of operation required to heal the fistula.

When openings are high the bladder and rectum are dissected apart and the openings are freshened and closed by through-and-through reinforced by linen Lembert sutures (Figs. 276, 277, *A*).

Where the fistulous opening is large and its closure by plastic surgery is not feasible, feces are diverted from the bladder and



Fig. 277.—Operation for rectovesical fistula where the organs are dissected free and openings in rectum and bladder are separately sutured with the aid of a rubber tube attached to the bowel. *A*, Method of introducing infolding sutures.

rectum by an *inguinal anus*. Following colostomy and vesical drainage the fistula sometimes closes, and there is no serious objection to this plan of treatment because when successful the artificial anus is closed with little difficulty. Colostomy is the operation of

choice where the fistula is secondary to cancer, tuberculosis, or inoperable stricture because it minimizes suffering and prolongs life.

Once or twice *partial resection* of the rectovesical septum cured aggravated cases of rectovesical fistula. When the sinus connects sigmoid and bladder the operative treatment is similar to that just outlined. Openings in the colon and small intestine are more easily dealt with than rectal because they can be closed and buried by infolding sutures, and resection for cancer and other disease causing enterovesical fistula is easier than when these affections attack the lower sigmoid or rectum.

In inoperable cases where colostomy is declined the patient is kept comfortable with soothing rectovesical irrigations and morphin.

**Recto-urethral Fistula.**—In this condition a fistula intervenes between the urethra—usually membranous or prostatic portion—and rectum (Fig. 275, *B*). These tracks are rare, but have occurred more frequently since the inauguration of prostatic massage, which is often practised by ignorant or careless practitioners.

Urine constantly dribbles into the rectum when the urethral opening is high and feces are evacuated through the penis more frequently when the rectal is situated above the urethral opening. As a rule the sinus travels downward and backward or directly across the space between rectum and urethra. Generally the rectal outlet is situated anteriorly from  $\frac{1}{2}$  to 1 inch (12.7 mm.—2.54 cm.) above the anus, though it is occasionally located posteriorly or at the side of the lower rectum.

**Etiology.**—Most urethrorectal fistulæ are traceable to careless introduction of sounds, catheters or enema tubes, pointed instruments, foreign bodies swallowed or introduced into the bladder or rectum, urinary calculi, marginal ischiorectal or pelvirectal abscess; or operation on the rectum, urethra, prostate, or bladder. Recto-urethral sinuses are occasionally induced by cancer, tuberculosis, and specific ulceration of the rectum or bladder, and have resulted from injury that caused necrosis and perforation of the rectum, bladder, or both.

The author treated two men for recto-urethral fistula caused by rupture of the urethra and urinary extravasation (Fig. 274), and in another case the urethra was incised during perianal excision of the rectum for carcinoma. He has also observed cases resulting from abscess, fistula, prostatic and urethral operations, and tissue infection brought about by unclean or rough rectal massage.

**Symptoms.**—When the bladder and rectum are punctured



with an instrument or during operation urine immediately escapes into the rectum, and if the opening is large semisolid or fluid feces may be voided shortly *per urethra*. In case of urethrorectal fistula secondary to stricture, cancer, or ulceration of the urethra, prostate, bladder, or rectum the usual symptoms of these conditions precede formation of the fistula.

Proctitis accompanied by burning pain, tenesmus, sphincter-algia, constipation, painful defecation, or occasionally diarrhea and excoriation of the perianal skin, together with cystitis or urethritis, edematous meatus, frequent micturition, painful urination and voiding of urine through the rectum, or gas and feces through the penis are the characteristic symptoms and signs of recto-urethral fistula. When secondary to cancer, tuberculosis, or ulceration involving the rectum, bladder, or neighboring organs the manifestations of these affections are observed.

**Diagnosis.**—When urine dribbles through the anus the patient suffers from rectovesical or recto-urethral fistula and location of the opening is determined with the aid of a sound and by digital examination, urethroscopy, proctoscopy, cystoscopy, and probing which are necessary to ascertain whether the rectal sinus opens into the urethra or bladder.

Colored fluids injected into the penis immediately appear in the rectum when the opening is in the urethra, but in rectovesical fistula it is necessary to distend the bladder when following introduction of the proctoscope fluid is seen dribbling through the rectal end of the sinus.

Tuttle differentiates between *recto-urethral* and *rectovesical* fistula as follows:

#### URETHRORECTAL FISTULA

Rarely congenital.  
History of urethral or prostatic disease.  
Contents pass from one channel to the other only during functional action.  
Amount of material passed is small and irregular.  
Cystitis and frequent micturition rare.  
Opening in rectum generally low down.  
Sound in urethra can be felt by probe or finger in rectum.  
Colored fluids injected into bladder do not appear in rectum until micturition takes place.  
Deposit of cicatricial connective tissue is generally large and easily felt with finger in rectum.  
Fistulous opening in rectum generally small and the tract can be made out by rectal touch.

#### VESICORECTAL FISTULA

Generally congenital.  
History of peritonitis or intestinal disease.  
Contents pass abnormally without regard to functional action.  
Amount of material passed is large and constant.  
Cystitis and frequent micturition without exception.  
Rectal opening generally well up cavity.  
Sound in urethra cannot be felt through rectum.  
Colored fluids appear in rectum immediately after injection into bladder.  
Deposit of cicatricial connective tissue generally small and above the reach of the finger.  
Opening in rectum generally large and no tract can be felt.

**Prognosis.**—Accidental and operative recto-urethral fistulæ occasionally heal spontaneously when the bladder is drained, but when they do not the majority are cured by plastic operation.

Communications between the urethra and rectum caused by cancer, tuberculosis, syphilis, or specific ulcers complicated by mixed infection are seldom healed where the opening is large, and the patient suffers until he dies from some other disease, exhaustion, cystitis, or nephritis unless an artificial anus is formed.

**Treatment.**—No universally satisfactory operation has been suggested for urethrorectal fistula, which is not surprising, since urine and feces are evacuated frequently, making it difficult to prevent contamination, and muscular activity about the wound delays healing. These tracts are difficult to reach and eliminate when the rectal or urethral opening is high without leaving distressing sequelæ, and multiple operations are sometimes required to completely heal the fistula; probably not more than 25 per cent. of urethrorectal sinuses are permanently cured by operation.

In 2 cases where sinuses were low the author obtained perfect results by incising the perineum, laying tracts open from urethra to rectum, freshening the urethral opening, draining the bladder, and letting the perineal wound heal by granulation.

Cauterization of recto-urethral fistulæ with silver nitrate, zinc chlorid, or the actual cautery has not benefited the author's patients.

It is useless to operate on urethrorectal fistula caused by cancer, stricture, tuberculosis, or other disease involving rectum or urethra until after the affection responsible for it has been eliminated.

Neither treatment nor operation is successful unless the sinus or wound is kept protected from urinary and fecal contamination by irrigation, topical applications, tying the bowel up with medication, restricting the diet, or diverting feces from the rectum by forming an artificial anus.

**Surgical Treatment.**—Where the fistula is straight and low down it is exposed by dissection, carried through the perineum, ligated at both extremities, and *excised*. In other cases it is advantageous to remove the sinus, freshen and close the buttonhole-like openings in urethra (Fig. 278, *A, B, C, D, E, F*) and rectum, and complete the operation by suturing the perineum.

Whatever technic is employed it is advisable to mobilize the mucous membrane of the lower rectum, draw it down and anchor it so that the level of the rectal is lower than the urethral opening (Fig. 278, *E*), which lessens danger of infection from feces where the sinus has been excised.

In Tuttle's operation the rectum is incised through the anterior median line to the urethra and the cut extended from the scrotal juncture of the perineum into the fistulous opening. Following

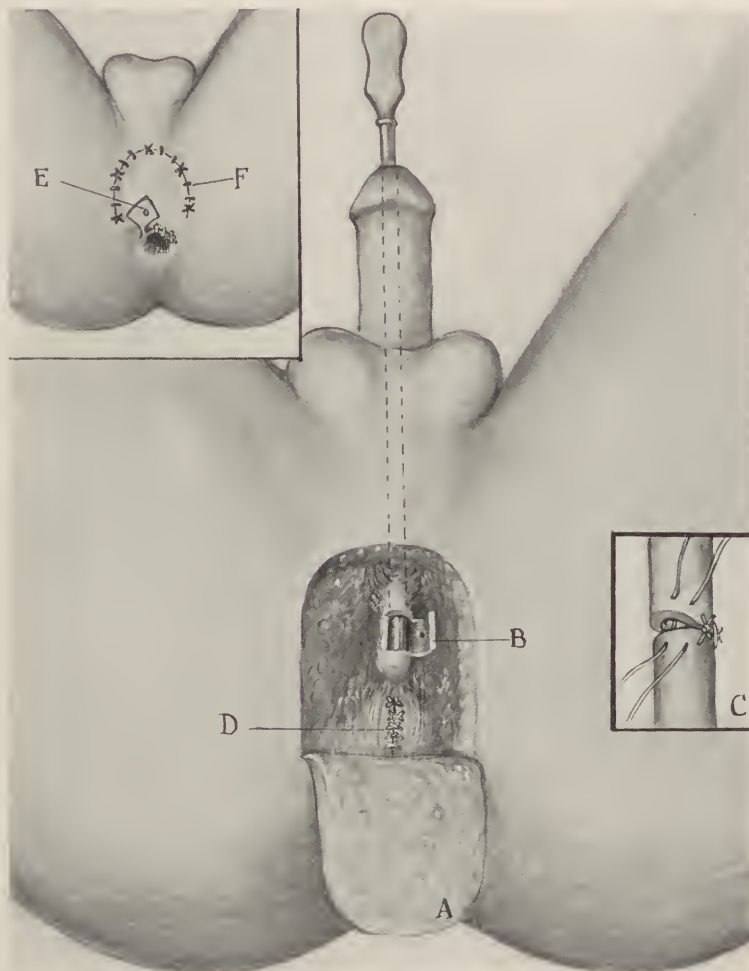


Fig. 278.—Author's technic of closing recto-urethral fistula: *A*, U-shaped flap incision; *B*, cuff-like resection of perforated urethra; *C*, anastomosis of urethra over sound, using superficial and deep sutures; *D*, rectal opening excised by an elliptic incision and closed with catgut; *E*, anterior anal mucosa including rectal opening freed, brought down, amputated, and sutured to the skin when the aperture in the bowel is not closed as in *D*; *F*, wound sutured.

removal of cicatricial tissue about the sinus the intestinal wall is freed on either side of the urethra and made to replace the segment of the organ destroyed by suturing flaps over a sound; edges of the rectal wall are then sewed together as far as the sphincter, at

which point the mucous membrane is loosened on either side and approximated by stitches not involving the muscle. The incision into the urethra below the fistulous opening is left unsutured and a rubber catheter is passed into the bladder and anchored to the penis with adhesive straps. The dressing is completed by loosely packing the anterior perineal incision with gauze and leaving a tube in the rectum to facilitate the escape of gas and feces.

The author has cured 2 cases by resecting the involved urethra, suturing divided ends about a sound, and closing the rectal opening by a plastic operation as shown in Fig. 278, *A*, *B*, *C*, *D*, *E*, and *F*.

Infection is less apt to occur when the bladder is drained for several days following operation.

*Colostomy* with vesical drainage has been performed in the treatment of urethrorectal fistula, but the procedure is undesirable except in extreme cases, because it is seldom curative, the patient objects to an artificial anus in the side, and a second dangerous operation is required to close the opening when the patient does recover from his fistula.

**Perineal fistulæ** may be induced by a kick, fall, careless instrumentation, operation, extravasation of urine, and disease or abscess affecting the buttocks, urethra, or Cowper's glands.

**Symptoms.**—The manifestations are about the same in perineal as ordinary fistulæ except that urethral and vesical irritation are more distressing.

**Diagnosis.**—In these cases there is usually history of injury or disease involving urethra and the patient complains of difficult micturition, throbbing pain, swelling, and septic manifestations prior to the discharge of pus into the urethra, rectum, or through the skin.

When direction of the sinus is not ascertained by probing the fistula is injected with methylene-blue or other colored fluid to determine whether it enters the urethra or rectum.

**Treatment.**—When secondary to urethral stricture the stenosis is corrected before an attempt is made to heal the sinus.

Best results are obtained by *incising*, *cureting*, and *draining* the sinus in the manner advocated for the treatment of complete fistula, unless it is tubercular, when it is *divided* and *seared* with a Paquelin cautery to prevent extension of the tubercular process.

**Rectosacral fistulæ** caused by bone necrosis, injury, carcinoma, sarcoma (Fig. 587), tuberculosis, or syphilis (Fig. 243), occasionally encountered, are painful and difficult to eradicate.

In one of the author's cases rectosacral fistula was cured fol-



lowing splitting the rectum posteriorly, cureting the bone, and draining the rectal incision, which was carried through the sphincter to insure free drainage; in 2 other cases sinuses and rectum were exposed through a cut made along the right side of the sacrum, pieces of necrosed bone were removed, and openings in the bowel were freshened and sutured. In one instance the wound was drained and closed and in the other the external cut was permitted to heal by granulation; both patients were cured.

**Dermoids—hair cysts**—located on the posterior surface of the sacrum (Fig. 279; see Chapter IX) are a frequent cause of rectosacral fistula. Before infection these collections of detached

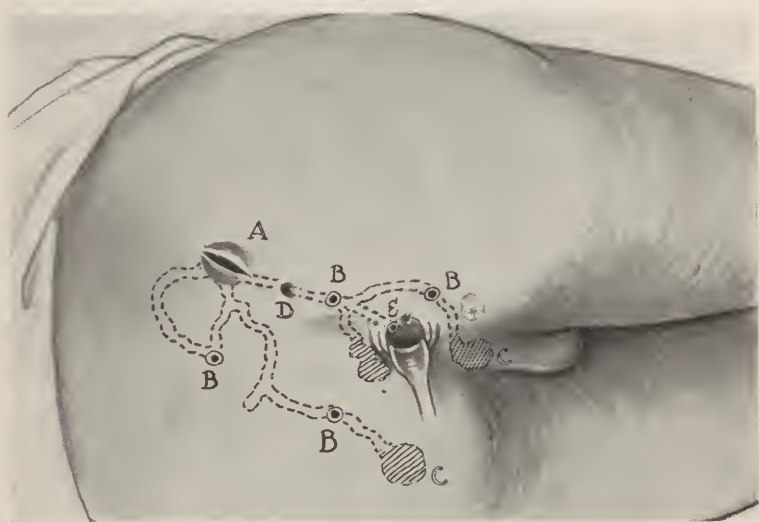


Fig. 279.—Pilonidal sinus—sacral dermoid cyst complicated by abscesses *A* and *B*, and *C*, multiple fistulae through which loose hairs were discharged; *D*, postanal dimple; *E*, rectal opening of fistula.

straight or curled hair are located by postanal dimples (Fig. 279, *D*), and after abscess and fistula have formed by probing or cureting the pilonidal sinus. Usually this type of fistula runs downward and opens upon the skin over the lower sacrum or coccyx in the median line, but occasionally descends through subcutaneous fat and passes around the lower end of the rectum or opens into the anal canal in the posterior median line at the sphincteric juncture.

Sinuses resulting from tuberculosis, syphilis, and injuries are more often connected with necrosed bone on the anterior surface of the sacrum, and the fistula may descend or encircle the rectum and find an outlet in the skin near or distant to the anus.

The symptoms of rectosacral are the same as other fistulæ except tenderness and discharge are observed in close proximity to the sacrum.

Dermoid cyst fistulæ are diagnosed by postanal dimples and location of the opening; and sacral sinuses caused by necrosis are recognized through probing, which elicits a peculiar sensation and grating sound when the probe comes in contact with the uneven surface of dead bone. The treatment for this type of fistulæ has been given in Chapter IX (Figs. 161, 162).

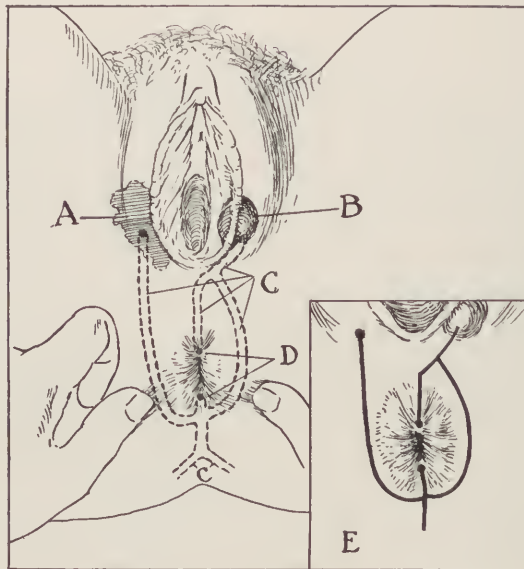


Fig. 280.—Bartholin's gland abscess and fistula: *A*, Complicated by infection of the labia; *B*, enlarged gland; *C*, multiple sinuses; *D*, fistulous openings located at the anterior and posterior anal commissure. Insert, *E*, shows lines of incision employed in this case.

**Rectococcygeal Fistula.**—This condition is rare and usually secondary to childbirth or external violence causing coccygeal necrosis. The author's only case was cured by removing the coccyx, cauterizing the rectal opening, and draining the wound.

**Bartholin's Gland Fistula.**—Abscesses involving one or both of Bartholin's glands often terminate in fistula (Fig. 217). Such sinuses may be short and lead straight into the gland, or longer and pass downward beneath the mucous membrane or deeper structures and discharge through the labia (Fig. 280, *C*), or open into the rectum in the anterior median line  $\frac{1}{2}$  inch (12.7 mm.) above the anus (Fig. 280, *D*). The author has treated cases where

the sinus discharged through an opening at the side of the anus or into the rectum posteriorly at the sphincteric juncture.

In addition to soreness, induration, and discharge these patients complain of acute pain when glands are palpated; manifestations which together with finding of fistulous openings in the anterior median line justifies a *diagnosis* of fistula involving Bartholin's gland.

**Treatment** consists in excising diseased glands, incising the fistula (Fig. 280, *E*) and branch sinuses, and leaving the wound to heal



Fig. 281.—Submucous and subtegumentary channels that sometimes complicate chronic proctitis and periproctitis.

by granulation. Unnecessary cutting is avoided because the severed perineal and sphincter muscles retract and fecal incontinence may follow the operation unless postoperative treatment is intelligently carried out.

**Submucous Fistula.**—Fistulæ that travel beneath the mucosa (Fig. 283) are not so common as subcutaneous sinuses (Fig. 281). They may be induced by infection of sebaceous or mucous glands, but more frequently submucous fistulæ are caused by an unhealed fissure, rectal wound, or injury where septic material is caught be-

neath the lesion; fish bones and sharp foreign bodies that penetrate the rectal tunics and tubercular, syphilitic, entamebic, bacillary, mixed infection, and other ulcers, catarrhal or specific ulcerative proctitis accompanied by undermining of the mucous membrane between ulcers are important etiologic factors in submucous fistula.



Fig. 282.—Radiograph of probes in mucous channels, claimed by Jamison to be a frequent complication of proctitis and pruritus ani.

Extrarectal abscesses usually penetrate all bowel tunics, but in some of the author's cases the inner mucous coat withstood pressure and pus collected beneath the mucosa forming submucous abscesses and fistulae variable in length, size, and contour. Submucous sinuses may be single or multiple, have microscopic or



macroscopic sized openings, and travel in any direction, but most frequently track upward or downward, where they sometimes worm their way beneath the perianal skin, forming what is designated *combined* or *submucocutaneous* fistulæ (Fig. 281).

*Mucous channels* or mucus-containing sinuses that run beneath the mucosa and skin of the perianal skin (Figs. 281, 282) are claimed by Jamison to be a frequent complication of proctitis, but the author has seldom observed them in cases of rectitis, but has treated many superficial fistulæ containing a mucocutaneous discharge or pus.

**Symptoms.**—Submucous induces less discomfort than ordinary fistulæ and patients complain of burning in the rectum, slight tenesmus, excoriation of mucosa and perianal skin, and seeping through the anus of pus that soils linen. When the opening is blocked and the discharge accumulates, the sufferer complains of a feeling of fulness and throbbing pain in the rectum and exhibits septic manifestations until pus ruptures through the old opening, at a new point, or is evacuated by operation.

**Diagnosis.**—Submucous fistula may be suspected on the basis of the enumerated symptoms, but a positive diagnosis is not ventured until the perianal region and rectum are carefully examined and openings leading to submucous channels have been located and probed.

Pus from submucous tracts is usually expressed by stripping the perianal skin and mucosa with fingers and thumb, which serves to locate the fistulous outlet. The opening may also be located through the window of a slide speculum, probing and palpating the rectum with the index-finger for a depression in the mucous membrane, soft granulations that extrude through openings or indurated areas.

Most often chronic submucous fistulæ are revealed by digital examination as narrow, elongated boggy ridges surrounded by fibrous tissue deposits that to the touch resemble carcinomata. The author has successfully treated 3 such cases referred to him for rectal cancer and proctectomy, who were cured by freely incising the main tract with its branches and draining the wound through the split sphincter. In another instance he made a diagnosis of submucous fistula and laid open an elongated oval swelling, and a large fish bone responsible for the trouble was removed.

The time required to heal a submucous sinus varies with the extent and character, but the prognosis is usually good when properly treated unless the tract is tubercular or the patient suffers from phthisis.

**Treatment.**—The sinus being in the rectum makes excision difficult and subsequent infection and abscess probable. Most submucous fistulæ are located through a speculum and split open from end to end under local anesthesia (Fig. 283), and the author carries the incision downward through the sphincter and perianal skin, thereby leaving a long smooth unobstructed wound that drains freely and is easily dressed.

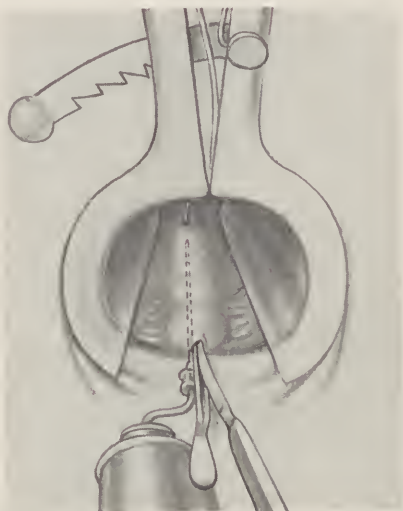


Fig. 283.—Complete internal submucous fistula being divided following infiltration of the mucosa with eucaïn.

Following division of the main sinus and branches the wound is cureted, overhanging edges of the mucosa are trimmed off, and the wound is tightly packed with gauze to arrest copious bleeding. The postoperative treatment of submucous is the same as for other fistulæ discussed elsewhere. Infection frequently follows *internal*, but seldom complicates *external* proctotomy in this class of cases.

## Chapter XXV

### Relation of Pulmonary and Anorectal Tuberculosis to Fistula in Ano

THE relationship between pulmonary and perianal tuberculosis to fistula in ano is a subject freely discussed by physicians, surgeons, and proctologists in ancient and modern times, and yet is not fully understood by the medical men. Older writers believed all fistulæ were tubercular, or if not, stopping the discharge would bring on pulmonary tuberculosis, skin affections, or other serious complications, and advised against their cure.

Fistula in ano may be associated with pulmonary tuberculosis, but this occurs less frequently than is believed by the profession. Again, most physicians and surgeons hold the majority of fistulæ are tubercular, which is not true. Of 5000 sinuses examined and treated by the author, less than 10 per cent. were tubercular. It is unfortunate that medical men regard the majority of fistulæ as tubercular because some physicians consider such sinuses incurable,

or hold phthisis develops when they are healed, and refuse aid to this class of sufferers, many of whom are curable by a local anesthesia five-minute operation.

It is difficult to determine the ratio between fistula and pulmonary tuberculosis because a "lunger" seldom tells the family physician he has a fistula, nor does the patient except when questioned inform the surgeon he has a cough. The percentage of patients afflicted with lung tuberculosis suffering from fistula in ano varies from 1 to 30 per cent. according to statistics of institutions specializing in pulmonary tuberculosis.



Fig. 284.—Multiple tubercular fistula complicated by anorectal ulceration and internal hemorrhoids.

A study of statistics compiled from several large sanatoria for consumptives together with an analysis of his cases has convinced the author that not more than 5 per cent. of individuals having pulmonary tuberculosis suffer from fistula in ano.

In this connection the author wishes to reiterate that fistulæ are not a common complication of pulmonary tuberculosis and that but a small percentage of fistulæ are primarily tubercular.

From the viewpoint of time required for healing and their relation to tuberculosis anorectal fistulæ may be subdivided into three groups:

1. Ordinary fistula in individuals having pulmonary tuberculosis.

2. Tubercular fistula (*primary*) in otherwise healthy subjects.

3. Tubercular fistula (*secondary*) in persons suffering from pulmonary tuberculosis.

Frequently individuals having lung involvement suffer from non-tuberculous sinuses that heal rapidly following operation unless the patient is already exhausted by lung or other complications.

Tubercular fistulæ that heal are occasionally encountered in persons having tubercular foci neither in the lungs nor elsewhere, but considerable patience and ingenuity are required, and it is unsafe to give an opinion as to the length of time it will take to cure them.

The most deplorable cases are those where the patient suffers from pulmonary tuberculosis and primary or secondary tubercular fistula, because the subject is so devitalized by double infection that healing of either or both lesions is always difficult and frequently impossible. In this class of cases fistula is often connected with extensive tubercular ulceration involving the rectal or colonic mucosa, sphincter, or perianal skin.

Tubercular ulcers and fistulæ of the anorectal region may result from infection caused by *human* or *bovine* bacilli, but the former is responsible for infection in 98 per cent. of cases. Tubercular fistula in ano may be primary or secondary, but in 95 per cent. the sinus is *secondary* to tuberculosis in other organs, usually the lung, and in 5 per cent. of cases the disease is *primary*, there being no connection between fistula and lung involvement. In patients having both pulmonary lesions and a tubercular fistula, the former usually shows first, but in a few instances the author has treated tubercular sinuses that preceded infection of the lungs or other organs which indicates that infection elsewhere is sometimes secondary to anorectal tubercular ulceration and fistula.

*Tubercle bacilli* seemingly enter the blood- or lymph-vessels



during or following operations on tubercular fistulæ, for joint tuberculosis has developed shortly following the laying open of sinuses.

#### SYMPTOMS

Early manifestations of tubercular uncomplicated by lung involvement simulate those of ordinary anorectal fistula; there is a discharge, discomfort in the rectum, and irritation of the perianal mucosa and skin, but the abscesses responsible for them take considerably longer to form, during which time suffering is appreciably less.

When the patient suffers from pulmonary tuberculosis and ordinary fistula or a fully developed tubercular sinus with or without ulceration he looks tubercular, and exhibits typical evidences of general tuberculosis—anorexia, marked loss in weight, weakness, cachexia, afternoon temperature, restlessness, night-sweats, cough, discomfort in chest, difficult breathing, and occasionally extreme anemia due to hemorrhage from the lungs.

Some patients treated by the author for tubercular fistula in no way resembled phthisical subjects, and the true character of the sinuses was not suspected until *tubercle bacilli* were discovered in the discharge, scrapings, or wall of the sinus.

Some tubercular fistulæ are more malignant than others, and in one case resemble ordinary fistula, and in the other the tubercular process extends in different directions from the tract, destroying the anal canal, sphincters, subcutaneous fat, and perianal skin, forming a deep, broad, irregular shaped, ulcerated area or cavity likely to be confused with perianal epithelioma or ulcerative elephantiasis—esthiomene.

Tubercular ulcers and fistulous openings usually have irregular, serrated, rounded, highly colored non-sensitive borders (Fig. 286), but are rarely sensitive to touch. Tubercular sinuses are seldom painful because of the large size of their internal and external openings, and free drainage which prevents the accumulation of pus, distention, and throbbing pain.

The discharge from tubercular anorectal lesions and fistula is abundant, thin, of a whitish hue, and possesses an offensive odor.

#### DIAGNOSIS

Tubercular fistulæ are nearly always *secondary to pulmonary tuberculosis* the result of swallowed *tubercle bacilli* that eventually reach and infect the rectum or perianal skin, hence most patients

exhibit signs of pulmonary manifestations. When in doubt as to whether or not a sinus is tubercular the discharge, scrapings from the tract, and sections from the fistula wall are examined for tubercle bacilli, which when found confirm the diagnosis.

Where the patient is emaciated and coughs the sputum is examined, and if tubercle bacilli are discovered there is reason for suspecting the fistula is tubercular, but it is well to bear in mind that anorectal fistulæ may be *primarily* tubercular and that patients afflicted with pulmonary foci may suffer from ordinary or *non-tuberculous* fistula.



Fig. 285.—Radiograph of tubercular rectal fistula leading into the pelvis injected with bismuth paste by Beck.

It does not follow that the tract is tubercular because tubercle bacilli are discovered about the anal mucosa or skin, since these organisms are frequently found about the anal region in subjects suffering from pulmonary tuberculosis having neither anorectal ulcers nor fistula.

*Smegma* found in the prepuceal, external genital, and anorectal regions closely resemble and have been mistaken for *tubercle bacilli*, and a differentiation must be made when attempting a diagnosis in suspected tubercular fistula.

In doubtful cases of *fistula in ano* the patient is subjected to the tuberculin tests to ascertain if he is tubercular. Tuberculin

reactions are of no diagnostic value when the patient suffers from pulmonary tuberculosis, since they point to a tubercular condition, but do not indicate location of foci.

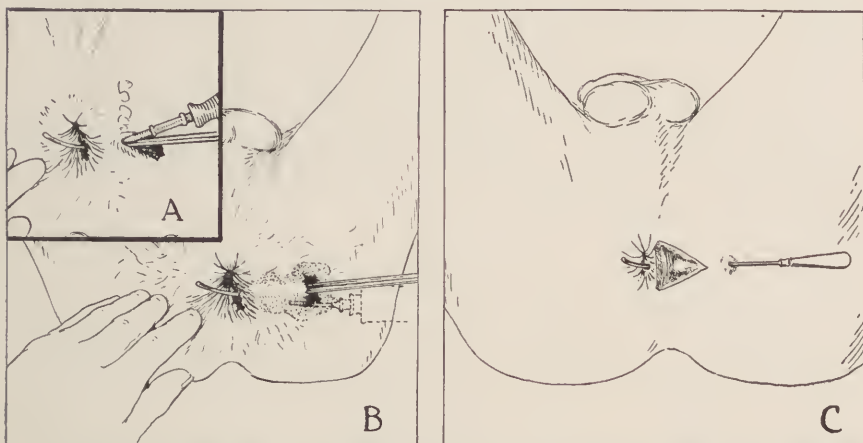


Fig. 286.—Difference in appearance between *B*, a tubercular sinus with large opening and undermined skin, and *C*, ordinary fistula with small opening. Insert: *A*, Dividing tubercular fistula with Paquelin's cautery to prevent extension of the tuberculous process by way of lymphatics.

The points of *differentiation* between *ordinary* and *tubercular* fistula (Fig. 286) are marked in typical cases, as will be seen by a glance at the accompanying table:

#### DIFFERENTIAL DIAGNOSIS BETWEEN TUBERCULAR AND NON-TUBERCULAR FISTULÆ

ORDINARY FISTULA	TUBERCULAR FISTULA
Internal and external openings small, round, and situated in the center of an elevation.	Openings large, irregular, and have undermined purplish edges.
Buttocks plump.	Buttocks emaciated.
Hairs of perianal region normal.	Hairs abundant, long, and silky.
No cachexia.	Cachexia.
Face, ears, and nose unchanged.	Face pinched, nostrils dilated.
Voice natural.	Voice usually husky.
No loss in weight.	Marked emaciation.
Discharge slight, thick, and yellow.	Discharge thin, profuse, and whitish.
Probing difficult.	Probing easy.
Appetite normal.	Appetite poor.
Digestion good.	Indigestion.
No night-sweats.	Exhausting night-sweats.
Sleep natural.	Sleep disturbed.
No lung involvement.	Pulmonary lesions with or without hemorrhages.
Discharge contains colon bacilli, streptococci, or staphylococci.	Discharge contains tubercle bacilli.
Tight sphincter.	Patulous anus.
Temperature normal.	Afternoon temperature.

## PROGNOSIS

The prognosis is fairly good for ordinary fistula complicated by pulmonary tuberculosis where the patient retains his vitality. Many tubercular fistulæ uncomplicated by lung foci and cases complicated by pulmonary lesions, where the subject is not greatly reduced, heal when intelligently operated and treated.

Tubercular sinuses in otherwise healthy individuals and ordinary fistulæ in tubercular subjects heal slowly, and when improperly treated the patient gradually or rapidly declines and dies from exhaustion or complications.

## TREATMENT

Palliative measures are not curative, but keep the patient comfortable and strengthen tubercular subjects for operation or prolong life in inoperable cases. Palliative measures consist in enlarging fistulous openings, cleansing and draining the sinus, stimulating ulcers, and prescribing salves, suppositories, or dusting-powders to relieve pain and allay irritation of anal mucosa and skin. Patients having ordinary fistula and lung involvement or a tubercular sinus do better when above measures are reinforced by open-air treatment, tonic emulsions, forced feeding, keeping the bowel open, and having the patient abstain from exercise when running a temperature.

**Operative Treatment.**—The author no longer hesitates operating on tubercular or ordinary fistulæ complicated by pulmonary tuberculosis, as do some surgeons who fear lung complications or skin disease will develop should the tract heal and the discharge stop.

The vitality of the patient determines whether or not an operation is indicated. The author operates on persons having pulmonary tuberculosis and ordinary fistula, individuals suffering from a primary tubercular sinus, and subjects afflicted with both pulmonary and tuberculosis of the perianal region whose *vitality* is good; he has frequently cured these types of fistula and succeeded in fully restoring to health this class of sufferers by sending them to the mountains, where tubercular foci in the lungs healed quickly following elimination of the fistula.

Where two destructive processes are exhausting the patient it is easy to understand why arresting of one helps nature and treatment to overcome the other.

Occasionally primary and secondary tubercular fistulæ and ordinary sinuses in tubercular subjects are not healed by palliative or operative measures, and the patient dies of pulmonary or ex-



haustion from local lesions. Fistula patients are not operated by the author when their vitality is very low and healing could not be expected to take place.

Many apparently healthy individuals suffering from ordinary or tubercular fistulæ have *latent tubercular foci* in the lungs and die shortly following operation, which is blamed for the fatality. The author has never lost a patient under these circumstances except where the operation was performed under *ether* or other general anesthetic, which, in his opinion, irritated the lungs and incited the tubercular process to renewed activity.

Anorectal tubercular sinuses (Fig. 286) and the majority of ordinary fistulæ in tuberculous subjects are readily operated on under *local anesthesia*, since the sinus is short and usually tracks through subcutaneous fat. Rare deep and complicated fistulæ requiring general narcosis are divided under gas, gas-oxygen, or chloroform anesthesia, but never ether, which is unsafe in this class of cases, since it aggravates lung lesions.

Tubercular sinuses are painlessly operated in five minutes following infiltration of the bridge of tissue overlying the tract with a  $\frac{1}{8}$  per cent. eucain solution (Fig. 286). After the sinus has been divided and overhanging mucosa and skin edges removed with knife, scissors, or cautery (Fig. 286) it is treated with carbolic acid or cauterized to prevent extension of the infection by way of injured lymph- or blood-vessels, and then packed with gauze to arrest and prevent bleeding.

The **postoperative** treatment of tubercular is about the same as for ordinary fistula wounds except they require more stimulation and the patient is instructed to sleep with windows open, spend his time out-of-doors, drink plenty of milk, and eat abundantly of eggs and nourishing food, for these sufferers never do well, and frequently die when confined to bed in poorly lighted and ventilated rooms.

Before the advent of local anesthesia the *ligature operation* (Fig. 266) was resorted to in tubercular fistulæ, since it avoided a general anesthetic and placing the patient in a hospital, but the procedure has been abandoned because it is painful, several days are required for the ligature to cut out, and results are not so good as when the tract is divided with the cautery (Fig. 286).

Some surgeons *excise* tubercular and ordinary fistulæ in tubercular subjects, but the author's experience has shown this procedure to be inferior to the *division* operation.

## Chapter XXVI

### Fecal Incontinence of Adults and Children. Patulous Anus

**General Remarks.**—Fecal incontinence is the involuntary discharge of feces and flatus, which follows the loss of control over the sphincter ani muscle. It is not accompanied by pain, but the mental suffering of patients having lost control over movements is great, because flatus and feces involuntary escape at any time without their knowing or being able to prevent it, and in spite of cleanliness there is often an offensive odor attached to the person



Fig. 287.—Correct position of thumbs when divulsing the sphincter in hemorrhoidal and other operations. When the muscle is overstretched or divulsed too rapidly with fingers, speculum, or dilator, the sphincter may be ruptured (A), causing fecal incontinence.

or clothing of such individuals. This class of sufferers, who often are otherwise healthy, obtain little sympathy, and their condition renders them nervous, irritable, despondent, and unfit for social or business affairs.

Loss of sphincteric control may be *congenital* or *acquired*, and in the majority of cases is due to bad surgery and improper treatment of anorectal wounds. Fistula operations are most often

responsible for it and incontinence will be diminished at least 80 per cent. when surgeons and physicians learn to properly operate and treat fistula wounds and stop overdivulsing the sphincter muscle (Fig. 287) with fingers and mechanical dilators during operations when attempting to cure constipation, fissures, etc.

Fecal incontinence occurred in only 1 per cent. of the last 1000 anorectal fistula operations performed by the author and the condition has rarely followed his fistula operations, except where postoperative treatment was left in the hands of another physician, hence he does not hesitate to sever the sphincter in such cases.

#### ETIOLOGY

The causes of fecal incontinence are *non-operative* and *surgical*, but the latter are more often responsible for the condition.

**Non-operative Causes.**—Chief among non-surgical factors in loss of sphincteric control are congenital defects at the rectum and anus and anomalies in the brain or lumbar cord centers (Fig. 288) controlling motor nerves of the bladder, rectum, and anus.

Congenital and acquired syphilis, chancroids, and phagadenic, syphilitic, tubercular, entamebic, bacillary, balantidic, mixed infection, malignant, and other ulcers that destroy by ulceration or otherwise impair sphincteric function are occasionally responsible for this distressing condition.

Occasionally fecal incontinence results from laceration of the lower rectum and sphincter caused by an injury, falling on a sharp object, evacuation of enteroliths, impacted fecal masses or foreign bodies swallowed or introduced through the anus, insertion of sharp, rough, or imperfect syringe nozzles or hand, speculum, proctoscope, or bougie during examinations and passage of a child's head during labor. The author has treated many cases where the perineum and anal muscles were partially or completely lacerated during confinement, and handled another case of incontinence where the sphincter was paralyzed without apparent injury to the perineum during parturition.

Fecal incontinence usually precedes death, is an occasional complication of old age and wasting disease that weakens the sphincter, has been observed in connection with chronic alcoholism and neuritis, and is sometimes a symptom of uremia, typhoid, acute febrile diseases of childhood and adult life, profound sepsis, and ptomain poisoning.

Loss of sphincteric control has followed muscle fatigue brought on by diarrhea, straining, frequent muscular spasms caused by irri-

tation, disease at the anus, chronic invagination of the sigmoid flexure and procidentia recti where the gut constantly extruded the anus (Figs. 380, 913) and paralyzed the muscle through frequent distention.

The author has several times observed incontinence as the result of protruding hemorrhoids (Fig. 289) or polyps (Fig. 299) that prevented the sphincter from contracting, and this deplorable condition has been induced by pederasty.



Fig. 288.—Patulous anus as it appeared in a case of fecal incontinence caused by disease in the lumbar cord.

Involuntary evacuations have also been observed following heat-stroke, profound shock, fright and other psychic emotions, nervous affections, hysteria, myelitis, apoplexy, locomotor ataxia and tumors, injuries or disease of the brain and lumbar cord centers presiding over defecation and the sphincter muscle.

**Surgical Causes.**—Fecal incontinence is more often caused by surgical operations and their sequelæ than in other ways.

Operations most frequently responsible for the condition are performed for the relief of *fistula*, *hemorrhoids*, *anal ulcers*, *fissure*,



*stricture, cancer, anorectal congenital defects or their sequelæ, and constipation.*

Fistula operations are the most common cause of incontinence (Figs. 290, 292), yet this calamity is avoidable in nearly every case where the sinus is correctly operated and subsequent dressings are properly made.

Incontinence occurred in only 1 per cent. of 1000 fistula operations performed by the author on private patients, and loss



Fig. 289.—Typical appearance of large extruded internal hemorrhoids with edema of surrounding skin responsible for partial fecal incontinence.

of sphincteric control has rarely followed this class of operations in his clinic and hospital practice except where postoperative treatment was carried out by an inexperienced nurse, hospital intern, or family physician who wished to dress the wound after his patient left the hospital.

A large private and hospital practice in anorectal diseases has convinced the author that *severing the sphincter* in fistula operations is alone rarely responsible for fecal incontinence. Expert

proctologists who almost daily divide the anal muscle in the treatment of various anorectal affections know that loss of sphincteric control seldom follows cutting the sphincter, yet they frequently

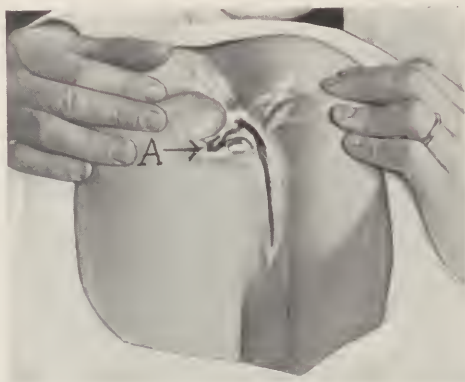


Fig. 290.—Multiple scars as they appeared in a nearly healed extensive fistula wound: *A*, Deep sulcus responsible for complete fecal incontinence.

encounter patients who suffer from incontinence the result of single or multiple fistula operations where a sulcus, V-shaped cicatricial notch, is left that separates severed sphincter ends causing incontinence (Fig. 290).

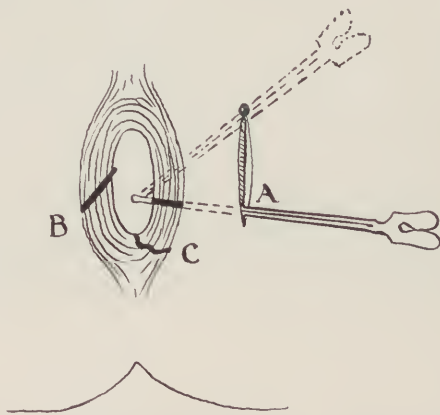


Fig. 291.—Severing the sphincter in the division operation for fistula: *A*, The *right way*, where skin and subcutaneous structures are incised to permit the director to cross the muscle at a right angle; *B*, the oblique, and *C*, zig-zag cuts—*wrong ways* of dividing the sphincter, since they are followed by fecal incontinence owing to subsequent non-approximation of muscle ends.

A close study of sequelæ induced by fistula operations has convinced the author that failure to heal the sinus and fecal incontinence following the surgical treatment of fistula are due to an

*imperfect operative technic* or *incorrect postoperative treatment*—(a) cutting the muscle obliquely (Fig. 291, *B*) or in zigzag fashion (Fig. 291, *C*) instead of at a right angle (Fig. 291, *A*), (b) tightly packing instead of loosely draining the wound, (c) permitting skin or mucosa to grow into the cut and separate muscle ends, (d) frequent cauterization of the wound, (e) unnecessary pulling apart and probing of the cut, (f) neglecting dressings so that acrid discharges collect which delay healing, (g) unnecessarily dividing the sphincter at two or more points (Fig. 292), and (h) severing ligaments, nerves, and muscles directly or indirectly connected with the anorectal region.

In a previous work the author stated his belief that fecal incontinence following fistula operations was due to severing the *internal* with the *external* sphincter, but he no longer hesitates

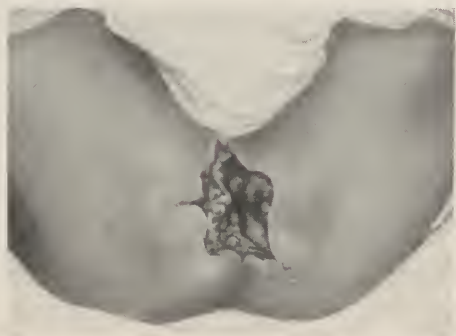


Fig. 292.—Showing long, deep, multiple wounds responsible for temporary fecal incontinence as they appeared three weeks following operation for extensive horseshoe fistula having a perineal and three rectal openings.

about dividing the internal sphincter, so-called, which is a continuation of circular muscle-fibers composing the rectal wall, is involuntary and has no control over the anus.

To cure and prevent recurrence of fissure in ano and eliminate constipation responsible for it the author has split the anal canal or lower rectum including both sphincters and fibers of the levator ani muscle 600 times without causing complete fecal incontinence, but partial loss of control over the movements was occasionally observed for a short time following operation.

The external sphincter has been severed *two* or *more* times by the author in 50 fistula operations with loss of fecal control in only one case, but it must be borne in mind that the levator ani partially assumes its functions after the anal muscle is destroyed.

Multiple cutting of the sphincter muscle (Fig. 292) is unneces-

sary when intercommunicating sinuses are incised before the tract entering the rectum posteriorly at the sphincteric juncture has been divided (Fig. 253) which demonstrates there is but one opening in the rectum in the majority of cases.

Fibers of the levator ani blend with the *sphincter muscle*, and Krouse holds the former separates and draws divided ends of the latter upward and that as a result scar tissue forms a sulcus between them, causing fecal incontinence. This is not plausible, otherwise incontinence would follow fistula and fissure operation very much more frequently than it does.

Following division sphincter ends may possibly become approximated later, but the author holds this seldom occurs and that a new segment of muscle is formed or the intervening space is filled with new elastic tissue that contracts in harmony with the sphincter. It is difficult to understand how it is possible for nature to re-establish continuity of fibers of this exceedingly thin muscle when after being severed its extremities and edges of the wound retract and are kept apart with gauze dressings as healing takes place, and further, because in many fistula operations, as scar tissue forms and contracts, muscle ends are frequently thrown out of line, which would prevent their ever reuniting. The author when operating for procidentia recti, epithelioma, or encysted foreign bodies has many times removed sections of the external sphincter varying from  $\frac{1}{2}$  to 1 inch (12.7 mm.-2.54 cm.) in length and left the wound to heal by granulation without impairing sphincteric control, and it does not seem reasonable that sphincter ends grew together in such cases.

Incontinence is encountered more frequently in women than men, owing to injury to the muscle during labor and difficulty of regaining control following anterior or lateral division of the anal muscle because the *sphincter vaginae* pulls and keeps muscle ends apart.

Activity of muscles connected with the lower rectum partially accounts for the slow healing of wounds, patulous ani, and fecal incontinence resulting from fistula operations.

Generally where incontinence follows correct division of the sphincter and intelligent postoperative handling of the wound the patient suffers from locomotor ataxia or other constitutional or disease of the brain or spinal cord that is partially or wholly responsible for lack of sphincteric control.

*Hemorrhoidal* operations sometimes cause fecal incontinence where a section or the entire anal muscle is excised during Whitehead's (Fig. 293) or other excision operation.



The author has treated 25 patients for partial or complete incontinence following Whitehead's operation where the so-called pile-bearing area together with the sphincter or sphincteric segments (Fig. 293) were removed or the muscle became entangled in scar tissue, and in such cases the patient received no warning of approaching feces or gas which involuntarily escaped at inopportune times. Loss of sphincteric control following ligature or clamp and cautery operations has not occurred in the author's practice.

Incontinence rarely follows division of the sphincter for *fissure* or *ulcer* of the anal canal when rightly done and the wound is drained and not packed.



Fig. 293.—Complete incontinence following Whitehead's operation caused by excision of the sphincter and sloughing of perianal structures.

External *proctotomy* performed for rectal stricture sometimes causes partial or complete loss of sphincteric control when post-operative treatment is negligently or ignorantly carried out.

Extirpation of the rectum for *cancer*, *stricture*, *procidentia recti*, *congenital deformity*, or *extensive ulceration* is occasionally responsible for incontinence because the sphincters are totally or completely excised or motor nerves supplying them are destroyed.

Fecal incontinence is a frequent complication of *imperforate ani*, *congenital defects* of the *anus*, rectum, or operations performed for their relief, since the anal muscle is weakened, absent, tied up by fibrous bands, or impaired by operations made to relieve obstruction, and has in some instances followed splitting the sphincter and levator ani muscles for *constipation* induced by a narrow anal canal.

The author treated a man for incontinence due to Ball's

operation for pruritus ani caused by snipping out a piece of the sphincter or severing controlling nerves.

**Degree of Incontinence.**—Extent to which sphincteric control is lost under the above circumstances varies, and it may be trivial, slight, moderate, or complete.

*Trivial* is evidenced by slight staining of clothing or cotton placed over the anus; *slight*, occasional escape of gas; *moderate*, (Fig. 289) by involuntary evacuation of gas and fluid feces, and *complete* fecal incontinence by entire loss of sphincteric control, where gas and fluid or solid feces are discharged at any time independent of the patient's will power to prevent it.

**Patulous Anus.**—A loose or patulous anus (Fig. 288) may be a manifestation of disease or sequela of operations causing loss of sphincteric control, and when observed a careful history is taken to determine what is responsible for the impaired muscle.

#### SYMPTOMS

The chief complaint of patients afflicted with fecal incontinence is the *involuntary discharge of flatus and feces* at inopportune times. The amount of gas and feces expelled and degree of the annoyance depend on whether incontinence is partial or complete, consistence of stools, and nervousness of the patient; involuntary movements are more frequent when diarrhea is troublesome than when constipation or hardened feces prevail and the patient is worried or excited.

Persons afflicted with this deplorable condition deserve the highest sympathy, because they are ostracized and unable to make social or business engagements fearing an accident, and realizing a disagreeable odor emanates from their person.

Fecal incontinence is aggravated by fright, violent exercise, and extreme heat which stimulate peristalsis and fluid movements. The anogluteal region of these patients is moist, inflamed, excoriated and smeared or stained with mucus and excrement, which escapes continuously or at intervals through a *sulcus* caused by operations or a patulous anus the result of an injury to or disease affecting brain or cord centers.

In *partial* the patient has time to reach the toilet before an accident occurs, following the warning of approaching feces, but when incontinence is *complete* a movement takes place before the patient is aware of it. In moderate and complete cases of fecal incontinence the anus remains patulous or a gap covered by scar tissue is to be seen (Figs. 288, 295). When loss of control over

movements is due to local, constitutional, cord, or brain disease symptoms of the affection responsible for it are in evidence and the anal muscle appears normal or flabby.

#### DIAGNOSIS

Fecal incontinence is easy to diagnose because the patient emphasizes the annoyance from involuntary movements, but often it is difficult to ascertain the cause or factors responsible for loss of sphincteric control. It is advisable to learn if the patient has or is suffering from disease, tumor, or injury of the brain or spinal cord, psychic emotions, locomotor ataxia, apoplexy, wasting disease, acute fever or other affection or anorectal congenital defect that might be responsible for incontinence; next one ascertains if the condition is traceable to an operation wherein the anal muscle was divided. The anorectal region is then carefully examined to determine if sphincteric function has been impaired or destroyed by ulceration, cancer, stricture, polyps, foreign body or fecal impaction that causes frequent straining, muscle fatigue, infiltration about the sphincter that prevents the muscle from effectively contracting and closing the anus.

Finally, when the source of incontinence has been detected by examining the sphincter and rectum with finger and proctoscope and learning from the patient whether annoyance is limited to slight staining of clothing, occasional escape of flatus, frequent involuntary discharge of liquid and solid feces, one can determine the extent of injury to the sphincter and *degree* of incontinence from which the patient suffers.

#### TREATMENT

Plastic operations for the relief of incontinence are not attempted until hemorrhoids, fissure, ulcers, fistula, tumors, or procidentia recti that irritate, ulcerate, fatigue, or distend the sphincter have been corrected.

**Prophylactic and Non-operative Treatment.**—Prophylaxis against this condition includes treatment of malignant and ulcerative lesions of the anus, preserving motor nerves supplying the anal muscle, leaving the lower inch of the bowel intact when excising rectal cancer, dividing the sphincter at only one point in fistula operations, cutting the muscle at a right angle, substituting drains for packs, preventing encroachment of skin or mucosa in the wound, discarding caustics and cauterization in the postoperative treatment, not severing fibers of the levator ani when the sphincter

is divided, avoiding snipping or the removal of the anal muscle in hemorrhoidal and other operations, employing fingers instead of mechanical dilators when distending the sphincter and treating the patient for local or constitutional disease that tends to weaken or impair function of the anal muscle.

**Palliative** treatment accomplishes little toward the cure of fecal incontinence in the majority of cases, but where leakage occurs as a result of a patulous anus brought about by nerve involvement, emaciation, muscular atrophy, wasting disease, syphilis, or old age the sphincter may be tightened and the patient's condition improved by tonics, forced feeding, and having him live an active outdoor life, which tends to strengthen the anal muscle.

Galvanism and other forms of electricity help in restoring tone to a weakened sphincter, where one electrode is placed in the rectum and the other on the abdomen or back, and some writers claim to have cured fecal incontinence with electricity where the muscle was entangled by cicatricial tissue, but in the author's hands it has always failed to restore loss of sphincteric control.

Non-operative relaxation of the sphincter—patulous anus—in children and run-down adults is occasionally overcome by cold astringent injections that tone and cause the muscle to contract when reinforced by strychnin.

**Surgical Treatment.**—Surgical interference is indicated in nearly all cases of fecal incontinence resulting from injuries to the bowel during labor or to operations performed for anorectal affections wherein the sphincter, other muscles, or controlling nerves have been lacerated, incised, or overstretched.

A **routine** operative technic is impracticable and the operation chosen to restore control over involuntary movements is based on indications in each case. The difficulty and extent of operations employed to cure fecal incontinence depends on whether leakage is *partial* or *complete*, causation of the condition, and extent to which the lower rectum and connecting nerves and muscles are injured.

It is more difficult to repair the damage where a broad scar (Fig. 295) keeps muscle ends widely apart than when they are separated by a thin ridge or narrow sulcus (Fig. 270) of cicatricial tissue and when the muscle is pliable.

**Preparation of the patient** for fecal incontinence operations consists (a) in thoroughly emptying and cleansing the bowel with laxatives and enemata and later tying it up with morphin, (b) flushing the rectum with peroxid of hydrogen (20 per cent.) the morning of the operation, and (c) administering morphin, gr.  $\frac{1}{4}$



(0.016), swabbing out the rectum, and painting the perianal skin with iodin.

**Plastic Operations.**—Where the perineum and sphincter have been slightly or extensively lacerated, causing complete fecal incontinence, occasionally perineorrhaphy (Fig. 294, *A, B, C, D*) is indicated. In this work chromicized catgut is employed for buried and silver wire or silkworm-gut for retention sutures. Edges of the wound are accurately approximated, so pockets will not be left to catch septic material, by protecting the suture line with a flap of mucosa and seeing that deep stitches pass beneath and not across the wound.

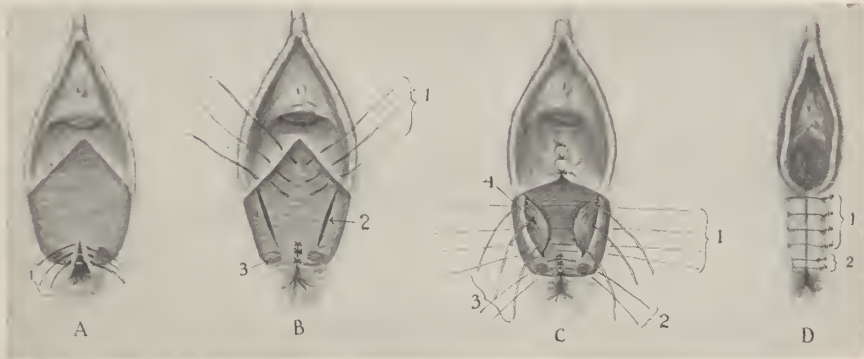


Fig. 294.—Operation for complete perineal laceration with fecal incontinence: *A*, Denudation of posterior vaginal wall, sphincter ani ends, and rectal tear; No. 1 ten-day chromic catgut sutures uniting the denuded rectal tear, 1. *B*, 1, Sutures of No. 2 ten-day chromic catgut introduced so as to elevate rectal wall—rectopexy; 2, lateral stab wounds to expose the levator ani; 3, denuded ends of sphincter ani. *C*, 1, No. 26 silver wire sutures through levator ani; 2, No. 26 silver wire sutures through sphincter ani ends; 3, medium kangaroo tendon sutures to approximate the separated levators—tie lightly so as not to strangulate the muscle; 4, the levator muscle delivered through the lateral stab wound. *D*, End-result: silver wires twisted with perforated shot crushed fast to ends; 1, sutures twisted loosely permitting finger to enter between suture and perineal wound; this allows for subsequent edema and swelling and sutures do not cut through the skin.

Surgeons in operating for fecal incontinence usually spend considerable time in trying to free, locate, and approximate severed sphincter ends, which is impracticable, because the muscle normally is thin, and in long-standing cases of incontinence is weakened or atrophied so that approximation of muscle ends is difficult or impossible.

**Author's Operation.**—Formerly the author, under general anesthesia, attempted to correct fecal incontinence by an elaborate operation similar to that shown in Fig. 294, but abandoned the procedure because considerable time was required and results were unsatisfactory.

In the last 20 cases plastic work has been quickly and satisfactorily accomplished and favorable results obtained under eucain infiltration anesthesia without attempting to free and accurately unite sphincter ends, and in no case has the operation required more than fifteen minutes.

The author's *technic* is simple and embraces the following steps:

*First Step.*—Tissue around the sulcus or sulci (Fig. 296, *A*) is injected with eucain until blanched.

*Second Step.*—The sulcus and adjacent cicatricial tissue are seized with vulsellum forceps, held, and excised along with a



Fig. 295.—Appearance of anus in fecal incontinence resulting from fistula operation. Note extensive scar and deep sulcus, the result of daily packing instead of draining the wound. Incontinence relieved by author's operation (Fig. 296, *A*, *B*, *C*, *D*).

*diamond-shaped flap* including the rectum, segments of sphincter muscle ends, and skin by two incisions made with knife or scissors crossing the muscle at a right angle, not less than  $\frac{1}{4}$  inch (6.35 mm.) from the sulcus (Fig. 296, *B*).

*Third Step.*—Edges of the rectal wound except mucosa are accurately approximated with buried interrupted chromic catgut reinforced by supporting wire sutures when indicated (Fig. 296, *C*, *D*).

*Fourth Step.*—After dissecting free and removing overhanging edges the mucous membrane is sutured with catgut to the right or left of the incision, which lessens danger of the wound becoming infected.

*Fifth Step.*—The skin wound is closed with plain gut, a drain is inserted, and a piece of gauze is placed in the rectum to protect the suture line.

This procedure has been effective in cases of partial and complete incontinence, has not been accompanied or followed by

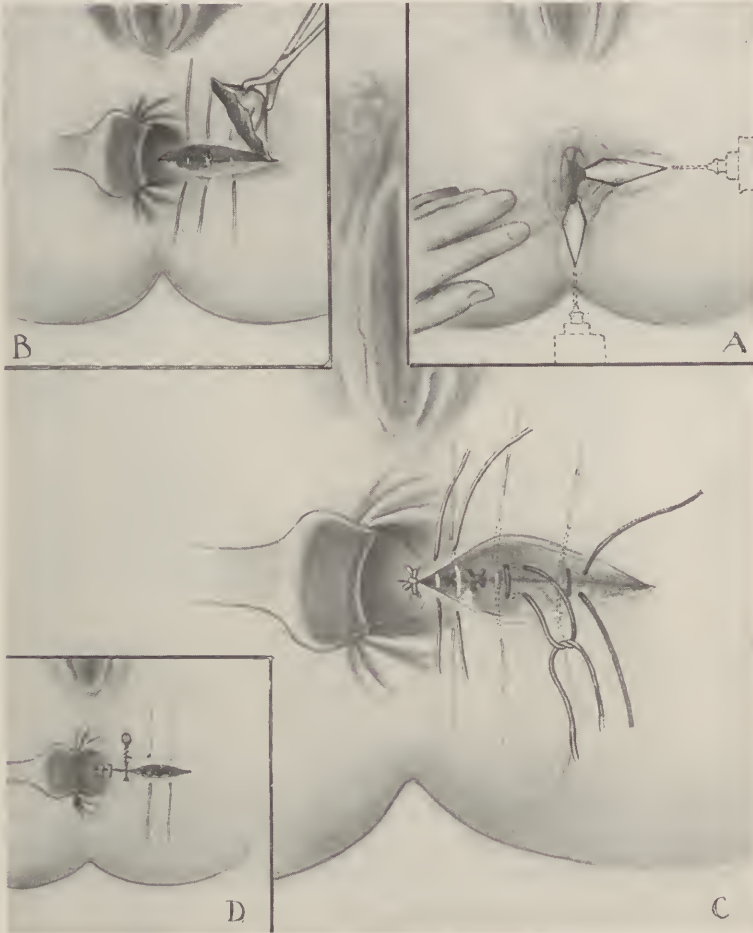


Fig. 296.—Steps in author's local anesthesia operation for fecal incontinence: *A*, Scars separating sphincter ends and lines of incision; *B*, diamond-shaped flap and scar excised; *C*, method of placing superficial and deep sutures; *D*, wound partly closed with one loosely tied wire suture in position.

serious complications or sequelæ, and is deserving of consideration because general anesthesia is unnecessary, the operation requires but ten minutes and few instruments, and appeals to the average patient because of its simplicity and short time it confines him to bed.

Results in 17 recent cases operated by the author according to the above plan were as follows: Fecal incontinence was *cured* in 9, *markedly improved* in 5, *slightly improved* in 2, and *no benefit* was observed in 1 case. Complete primary union was obtained in 5, and in other cases it was necessary to sever one or more sutures to provide drainage where infection occurred, but results in the latter were almost if not as good as in the former, for by careful postoperative treatment the gap filled with muscle or pliable tissue which acted harmoniously with the remainder of the sphincter to control the movements.

**Cauterization.**—Where incontinence or disease in the lumbar cord is secondary to extensive operations and cutting the sphincter muscle at two or three points or caused by extensive scars that

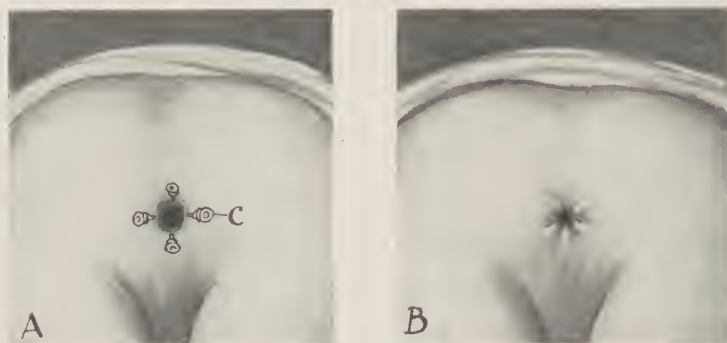


Fig. 297.—Incontinence resulting from disease in the lumbar cord: *A*, Patulous anus; *B*, partially strictured anus induced by linear cauterization to control fecal incontinence; *C*, anesthetizing needles.

distort the anus and tie up the sphincter or nerves supplying it, *plastic operations* having for their object approximation of muscle ends are impracticable. In such cases fair or complete control over semi- and solid feces is obtained by *linear cauterization* of the lower rectum, sphincter, and perianal skin at five equidistant points forming a stricture (Fig. 297, *B*) at the anus.

**Other Procedures.**—Willem frees the rectum, splits the gluteus maximus muscle, draws the bowel through, and sutures it to the skin where the sphincter has been removed or destroyed (Fig. 603); Gersuny attempts to prevent or lessen incontinence by freeing and twisting the bowel upon its axis (Fig. 602) before suturing it to the anal skin. Chetwood claims to have cured complete fecal incontinence by encircling the terminal rectum with muscular ribbons taken from the glutei muscles (Fig. 603), a procedure practised by



the author in 3 cases without improving the patient's control over the movements.

When the anus is occluded or the sphincter is tied up by cicatricial tissue the author dissects the lower rectum free, removes an inverted V-shaped flap (Figs. 604, 605), and brings the narrowed rectum out through a *buttonhole incision* and sutures it to surrounding skin, a very satisfactory procedure (Fig. 606, C).

**Colostomy.**—In deplorable cases following unsatisfactory attempts to overcome incontinence by plastic operations where gas, fluid, and solid feces frequently or continuously escape without warning as soon as they reach the rectum, an artificial anus is established.

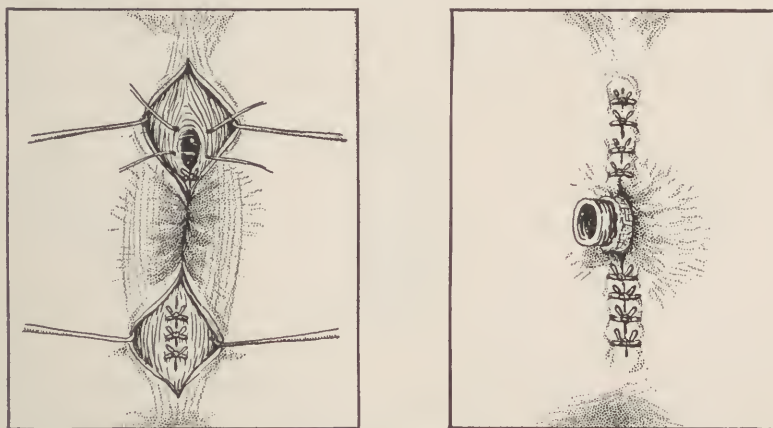


Fig. 298.—First step: Shortening sphincter ends for fecal incontinence caused by disease or injury in the lumbar cord. Muscle exposed and approximating sutures introduced. Second step: Wound closed and gauze-covered rubber tube introduced.

*Colostomy* as performed by the author gives almost complete control over involuntary evacuations, but many patients decline an artificial anus because they object to the inconvenient location of the opening and disagreeable odor emanating from it.

The author in several instances has diminished annoyance from incontinence by introducing a kangaroo tendon or chromic catgut *purse-string* suture about the lower rectum at the upper margin of the sphincter (Fig. 393); the suture stimulates the anal muscle to contract, become hypertrophied, and more effectively control involuntary movements.

The levator ani muscle can be made to perform functions of the sphincter muscle in some instances by shortening and suturing it to the rectum, as in proctectomy operations illustrated and discussed elsewhere (Fig. 639).

Plastic operations are not always effective where incontinence has been caused by Whitehead's operation or tearing apart of muscle-fibers by the fingers or instruments while divulsing the sphincter, but cauterization is helpful in this class of cases.

**Shortening the Sphincter.**—Where the anus is loose, the result of atrophy, brain or cord lesions, stretching by hemorrhoids or procidentia recti and the patient complains of leakage, the muscle is shortened and the anus tightened by exposing, freshening and approximating anterior and posterior sphincter ends with chromic gut sutures (Fig. 288) or excising segments of the muscle and reuniting sphincter ends with linen or catgut stitches.

Incontinence resulting from *procidentia recti*, prolapsing *hemorrhoids* (Fig. 289) or extruding *polyps* (Fig. 299, *A*, *B*) is cured by getting rid of the growth (Fig. 299, *C*) responsible for it.

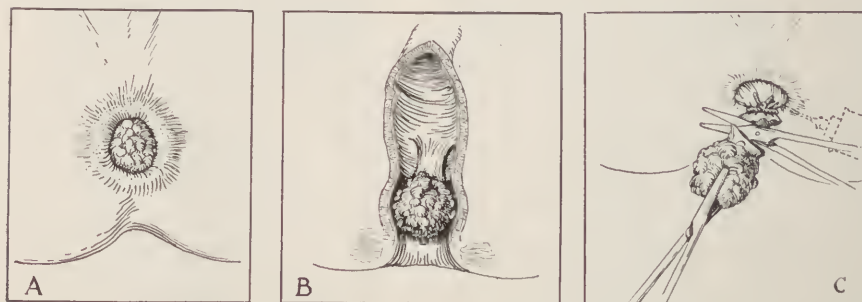


Fig. 299.—Fecal incontinence induced by constantly prolapsing polyp: *A*, Appearance of the anus; *B*, attachment of polyp to rectal wall; *C*, method used in excising the growth.

**Postoperative Treatment.**—Briefly summarized, postoperative treatment consists in keeping the patient on a fluid diet, regulating stools, cleansing, protecting the wound with gauze, and prescribing morphin and belladonna to ease pain and keep muscles of the anorectal region quiet.

#### PROGNOSIS

Partial or fecal incontinence lasting days or weeks is sometimes observed following extensive fistula and other operations where the sphincter or levator ani muscle has been severed, but the patient usually regains full control over movements before or shortly following healing of the wound.

Plastic operations usually correct or greatly improve the patient's condition where the muscle has been cut once or twice, but when the anus is distorted and the sphincter is extensively involved in scar tissue, involuntary evacuations sometimes con-

tinue to a greater or less degree irrespective of the treatment employed.

In deplorable *inoperable* cases life is made bearable through colostomy or having the patient wear a mechanical device that blocks and prevents the escape of gas and feces at inopportune times (Fig. 632, *A, B, C*).

#### FECAL INCONTINENCE IN CHILDREN

The author has treated 11 children, 7 boys and 4 girls, whose ages ranged from two to sixteen years, suffering from partial or complete loss of sphincteric control, some of whom had urinary incontinence. The average age of these patients was eight years and 3 children appeared normal in other respects. In this series there were no local lesions to account for incontinence, nor had an operation been performed for the relief of anorectal conditions.

The **etiology** of non-operative fecal incontinence, especially in children, is confusing and difficult to determine, but is due in most instances to congenital defects, tumors, or disease involving the brain, lumbar cord, or nerves controlling anorectal muscles.

In the author's cases fecal incontinence was most often observed in nervous and children mentally defective or those suffering from chorea. In addition to the above causes, loss of sphincteric control in children has been associated with or attributed to acute infection, diphtheria, scarlet fever, sepsis, wasting disease, paresis of the anovesical sphincters, auto-intoxication, lowered resistance, general paralysis, meningitis, epilepsy, convulsions, diminished glandular and internal secretion, phimosis, spina bifida, and disturbance of ganglionic nerve centers, one authority holding that rectovesical incontinence results from a functional disturbance of the hypogastric nerve.

Children having fecal incontinence are nervous, the result of punishment, shame, or affection from which they suffer, but seldom complain of pain. The chief annoyance is involuntary evacuations of gas and feces with or without the escape of urine that occurs at any time without warning, whether feces are soft, liquid, or solid, and on account of this these children are timid and shun their playmates.

The **diagnosis** is based on the statement of parent or child that there is no control over movements, and careful digital examination of the rectum which demonstrated the sphincter and other anorectal muscles are passive and offer no resistance to introduction of the finger. The anus is patulous and remains open following

separation of the anal margins or withdrawal from the rectum of the finger or proctoscope. When incontinence is caused by disease usual manifestations of the condition are observed.

**Treatment.**—Underfed and children run down from any cause recover in a few months or two or three years when strengthened by good air, exercise, nourishing diet, and administration of nerve and general tonics. Organotherapeutic remedies, thyroidon, parathyroidon, and adrenalin help to restore sphincteric control when incontinence is due to deficient internal secretion, and fecal incontinence has been improved by removing adenoids, correcting nasal defects, circumcision, and administration of ergot.

When loss of sphincteric control is associated with enuresis the injection of normal salt solution (100 c.c.) into the retrorectal space one or more times has given good results. When palliative measures fail the anal canal is tightened by the introduction of a buried purse-string chromic suture located on a level with the sphincter linear cauterization (Fig. 297), of the lower rectum, or shortening of the sphincter (Fig. 298).

In hopeless cases where other means fail to relieve fecal incontinence a controllable artificial anus is established after the author's plan elsewhere described.



## Chapter XXVII

### Hemorrhoids

#### HISTORY, GENERAL REMARKS, ETIOLOGY, CLASSIFICATION

**Definition.**—As interpreted by Greeks the term “hemorrhoids” means a passive or active flow of blood, and the word “pile,” from the Latin *pila*, signifies a ball or swelling.

Neither term now synonymously employed gives a correct idea of the condition designated as piles or hemorrhoids.

Since hemorrhoidal tumors vary in size, shape, color, location, structure, coverings, and accompanying manifestations the author has described individual types rather than attempt a general definition to cover all forms.

**Historic Note.**—Hemorrhoids have an interesting history, having been mentioned ten centuries before the Grecian era or the time of Hippocrates, and it is said that “pile doctors” were in Egypt before Joseph was sold into bondage.

References to hemorrhoids are found in the Bible. Moses (Deuteronomy, xxviii, 27), after enumerating a list of curses that would be visited on the children of Israel if they were disobedient, said, “The Lord will smite thee with the botch of Egypt, and with the ‘emerods.’” Three centuries later the Philistines who took the ark of the covenant were sorely afflicted as a result, and it states in the Scriptures, I Samuel, v, 9: “and he smote the men of the city, both small and great, and they had ‘emerods’ in their secret parts.” The Philistines asked their priests what they must do to obtain relief, and they said, “If ye send away the ark of the God of Israel, send it not empty; but in any wise return him a trespass offering, then ye shall be healed.” The Philistines then asked, “What shall be the trespass offering which we shall return to him?” The priest answered: “Five golden ‘emerods’ and five golden mice, according to the number of the Lords of the Philistines,” Samuel, vi, 3, 4.

In Psalm lxxviii we find, “and he smote his enemies in the hinder parts: he put them to a perpetual reproach.” Biblical commentators generally agree that “emerods” and hemorrhoids are the same and mean bleeding or hemorrhage and protrusion of the bowel.

Bernard Gordon, writing in the thirteenth century, evidently believed the curse of emerods threatened by Moses was carried out, for he claims hemorrhoids are common and hereditary among Jews, but there is nothing in the Scriptures or medical literature to show that Jews are more likely to be afflicted with piles than Gentiles. If Jews are more frequent sufferers from the disease it is because they take less exercise, consume more alcohol, and eat frequently and abundantly of highly seasoned food.

**General Remarks.**—Hemorrhoids are the most common affection treated by the proctologist in private practice, but the author has encountered fistula in ano more frequently in his dispensary and hospital work.

Many persons go through life suffering from hemorrhoids without applying for treatment because an examination is repulsive, they cannot afford expense of an operation, fear a general anesthesia, dislike being confined to bed, or dread discomfort and pain incident to their removal.

When patients come to realize hemorrhoids are painlessly operated on under local anesthesia in five or ten minutes, without confining them to bed more than two or three days, they will submit to treatment earlier and save themselves much annoyance and suffering. Since proctologists in recent years have greatly improved the technic of operating on piles, patients no longer have excuse for patronizing advertising "pile doctors" who infest our larger cities.

Hemorrhoids often induce discomfort, pain, or hemorrhage, but the author has never known a patient to die from them. He has treated 2 men who died from infection following gangrene that resulted from the injection of carbolic acid into the hemorrhoids by ignorant quacks.

Piles are encountered in all climates and walks of life, both sexes, at all ages, debilitated and robust individuals, persons following sedentary and active occupations, and people living amid luxurious and poor environments, but are more common during active periods of life. Hemorrhoids vary in form, location, number, size, color, consistence, and appearance.

**Form.**—Hemorrhoids are globular or oblong in shape, have a broad base, and resemble purple grapes or strawberries (Fig. 289),

**Location.**—Hemorrhoidal tumors may be located in the lower rectum or just outside, at the anal margin, and are designated, accordingly, *internal* and *external*.

**Number.**—Piles vary from one to eight and different types may be observed in the same case (Fig. 289). Ordinarily there

PLATE IV



Large and small external thrombotic hemorrhoids. Note clot extruding through an ulcer in the underlying skin.





are from three to five internal tumors, a single thrombotic pile, and one or more cutaneous tags—tabs.

**Size.**—Depending on their duration and condition when seen, hemorrhoids vary from pea to walnut size (Fig. 289). The thrombotic type may be as small as a shot or large as a pecan (Fig. 301), while venous internal soft piles are usually olive size. Highly inflamed, strangulated (Fig. 317), and edematous (Fig. 313) piles sometimes attain the size of an egg or lemon.

**Color.**—Hemorrhoidal tumors may be purplish, black, or of a bright reddish hue (Plate IV). Thrombotic piles resemble blue grapes and capillary piles are not unlike strawberries in appearance.

**Consistence.**—Cutaneous hemorrhoids feel like loose skin; thrombotic tumors are hard and feel like a bullet beneath the integument, while internal hemorrhoids are soft and pliable, but when inflamed, strangulated, or edematous they are firm and nodulated.

Procidentia recti and polyps are frequently confused with hemorrhoids, but in the former mucosa of the entire circumference of the bowel protrudes, which distinguishes it from piles which are attached at the sides of the rectum; polyps are readily recognized by their pedunculated attachments.

#### ETIOLOGY

The causes of hemorrhoids are many and diversified and piles are frequently associated with other rectal affections or disease in a neighboring organ that are responsible for or aggravate them.

No attempt is made to discuss all factors in or the many diseases said to have induced hemorrhoids, but the chief causes and their manner of inducing piles have received full consideration.

The causes of hemorrhoids are *predisposing* and *exciting*.

**Predisposing.**—In a large series of cases *heredity, temperament, environment, climate, seasons, habits, sex, occupation, age, and anatomic peculiarities* of the bowel are predisposing factors in hemorrhoids.

**Heredity.**—Successive generations of the same family may suffer from piles, while children of other parents afflicted with hemorrhoids are not troubled with them. The author does not believe hemorrhoids are hereditary, but concedes children of families who for generations have suffered from piles inherit certain traits, such as an abnormal taste for highly seasoned foods, desire for alcoholic beverages, irregular habits, constitutional weakness, digestive dis-

turbances, varicose veins, relaxed tissues, or constipation, which render them prone to the development of hemorrhoidal tumors. Were the condition hereditary they would probably be observed at birth, but typical hemorrhoids are seldom, if ever, congenital, and infants and young children rarely suffer from them.

*Temperament* does not cause piles, but indolent, nervous, despondent, choleric, and grouchy individuals frequently suffer from hepatic congestion or neurogenic conditions complicated by straining, which favor backing up of blood in valveless rectal veins.

*Environment*.—Persons who exercise in the open air or live in the country or elsewhere amid cheerful surroundings are not afflicted with piles as frequently as less active individuals whose environments are unwholesome.

*Climate and Seasons*.—Hemorrhoidal disease is more common in tropical and moderately warm than cold climates because inhabitants are indolent, have relaxed tissues, and are frequent sufferers from malaria, hepatic congestion, and chronic diarrhea, forerunners of dilated rectal veins.

Sudden changes from a warm to a cold temperature favor the development of hemorrhoids because blood is driven from the surface to internal organs and veins. Patients seek relief from piles more frequently in spring and summer than other seasons because hydrocarbons are more difficult to digest in hot than cold weather, and this with a change of diet and consumption of iced drinks frequently lead to congestion of the liver and diarrhea accompanied by persistent straining, which, in turn, causes engorgement of the hemorrhoidal veins.

*Habits*.—Indolent and irregular habits, gourmandizing, and drinking liberally of alcoholic beverages often induce congestion of the intestinal mucosa, portal and hemorrhoidal veins, conditions sometimes responsible for protruding bleeding piles. Irregular hours for exercising, sleeping, eating, and emptying the bowel are conducive to constipation, painful defecation, and straining, all of which are etiologic factors in hemorrhoidal disease.

*Sex*.—Men are apparently afflicted with hemorrhoids twice as often as women, which is partly accounted for by the fact that women less often apply for treatment, dreading an examination, and worry little about blood in the stools owing to their being accustomed to bleeding during menstrual periods.

It is difficult to understand why women do not suffer more frequently since pelvic and rectal veins are congested, pressed upon or traumatized during menstruation, pregnancy, or expulsion of the baby's head during labor, and women suffer from constipa-

tion and fecal impaction and straining more often than men. The predominance of hemorrhoids in males is probably due to exposure, arduous occupations, excessive drinking, and irregular habits.

*Occupation.*—Hemorrhoids are usually encountered in persons whose occupations subject them to exposure, keep them on their feet or erect, require lifting of heavy objects, take them where malaria or dysentery is prevalent, or necessitates their working in factories, machine and paint shops, where constipating gases or minerals are being inhaled or absorbed.

Firemen, conductors, floor-walkers, porters, laborers, truckmen, miners, messengers, and others whose occupations require constant standing or frequent bending over are common sufferers from piles; and individuals whose work keeps them in doors suffer more frequently from the piles than active farm hands who labor in the fresh air. Trainmen, traveling salesmen, policemen, night-watchmen, who eat, sleep, and attend to defecation at irregular hours, are frequently afflicted with internal hemorrhoids.

The constant vibration of ponderous machinery which shakes the floor and street cars, trains, carriages, and automobiles also lead to congestion of the valveless rectal veins.

*Age.*—Hemorrhoids are common during the active periods of life, twenty-fifth to fifty-fifth years, but are seldom met with in children and young adults.

Occasionally a dark bluish or purplish swelling at the side or extending around the anus is observed in infants and children suffering from constipation, anorectal defects, procidentia recti, narrow anal canal, polyps, worms, or diarrhea; conditions accompanied by painful defecation, tenesmus, or persistent straining that frequently cause *thrombotic*, but are rarely responsible for *internal hemorrhoids*. Any disease characterized by chronic rectal discharge may lead to hypertrophic changes in the skin and formation of *cutaneous* piles, skin tags—tabs.

Internal hemorrhoids are very rare in the young; when present are usually secondary to heart disease, hepatic congestion, circulatory disturbances, diarrhea, chronic proctitis, or anorectal obstruction.

Of 2500 hemorrhoidal cases collected by Karnitzke, 115 (4.6 per cent.) concerned children whose ages varied: 14 were five years or younger; 4, five to ten; 9, ten to fifteen, and 88 were from fifteen to twenty years of age.

The tables shown on page 424 give the author's experience with hemorrhoids in so far as they related to the ages of infants, children, and young adults treated by him.

Children afflicted with constipation, diarrhea, proctitis, stricture, narrowing of the anal canal, anorectal congenital deformity, or other conditions accompanied by persistent straining or an acrid discharge occasionally suffer from thrombotic hemorrhoids or skin tags, but are rarely troubled with internal hemorrhoids.

AUTHOR'S TABLE OF 17 CASES OF HEMORRHOIDS ENCOUNTERED IN INFANTS AND CHILDREN WHOSE AGES VARIED FROM ONE MONTH TO TWELVE YEARS

No.	Age.	Sex.	Variety.	Cause or complication.
1	1 month.	M.	Thrombotic.	Constipation.
2	2 months.	M.	Thrombotic.	Congenital anorectal syphilis.
3	5 months.	F.	Cutaneous—skin tag.	Congenital anorectal stricture.
4	4 months.	M.	Sentinel pile.	Fissure in ano and constipation.
5	6 months.	M.	Thrombotic.	Imperforate anus.
6	8 months.	M.	Cutaneous.	Ulcerative proctitis.
7	1 year.	F.	Internal venous.	Thread-worms and constipation.
8	1 year.	F.	Thrombotic.	Narrow anal canal.
9	18 months.	M.	Thrombotic.	Constipation.
10	2 years.	M.	Internal capillary.	Chronic diarrhea.
11	2 years.	F.	Skin tags.	Congenital anorectal syphilis.
12	3 years.	M.	Thrombotic.	Scar following operation for atresia ani.
13	4 years.	F.	Internal venous.	Constipation
14	5 years.	M.	Thrombotic.	Imperforate rectum operation.
15	9 years.	M.	Cutaneous.	Tubercular ulcerative coloproctitis.
16	11 years.	F.	Thrombotic.	Procedentia recti.
17	12 years.	M.	Internal venous.	Constipation and phimosis.

AUTHOR'S TABLE OF 19 CASES OF HEMORRHOIDS CONCERNING CHILDREN AND YOUNG ADULTS BETWEEN THIRTEEN AND TWENTY YEARS OF AGE

No.	Age.	Sex.	Variety.	Cause or complication.
1	12 years.	M.	Thrombotic.	Constipation.
2	13½ years.	F.	Thrombotic.	Atresia ani.
3	14 years.	M.	Internal venous.	Round-worms and constipation.
4	14½ years.	M.	Cutaneous.	Stricture following operation for imperforate rectum.
5	15 years.	F.	Internal venous.	Constipation.
6	15 years.	F.	Cutaneous.	Congenital anorectal syphilis.
7	15½ years.	M.	Thrombotic.	Constipation and phimosis.
8	16½ years.	M.	Thrombotic.	Foreign body and straining.
9	17 years.	M.	Thrombotic.	Procedentia recti.
10	17½ years.	F.	Internal venous.	Narrow anal canal.
11	17½ years.	M.	Internal venous.	Multiple rectal polyps.
12	18 years.	M.	Thrombotic.	Anal stricture from fistula operation.
13	18 years.	F.	Cutaneous.	Amebic colitis and diarrhea.
14	19 years.	M.	Thrombotic.	Constipation.
15	19½ years.	M.	Thrombotic.	Constipation.
16	20 years.	F.	Capillary.	Rectal procedentia.
17	20 years.	M.	Thrombotic.	Large fibrous polyps.
18	20 years.	M.	Internal venous.	Tubercular colitis.
19	20½ years.	M.	Internal venous.	Without apparent cause.



The author has treated more than 100 young adults for hemorrhoids whose ages range from twenty-one to twenty-five years.

*Anatomic Causes.*—The erect posture assumed by man while sitting, standing, or walking is evidently a factor in the production

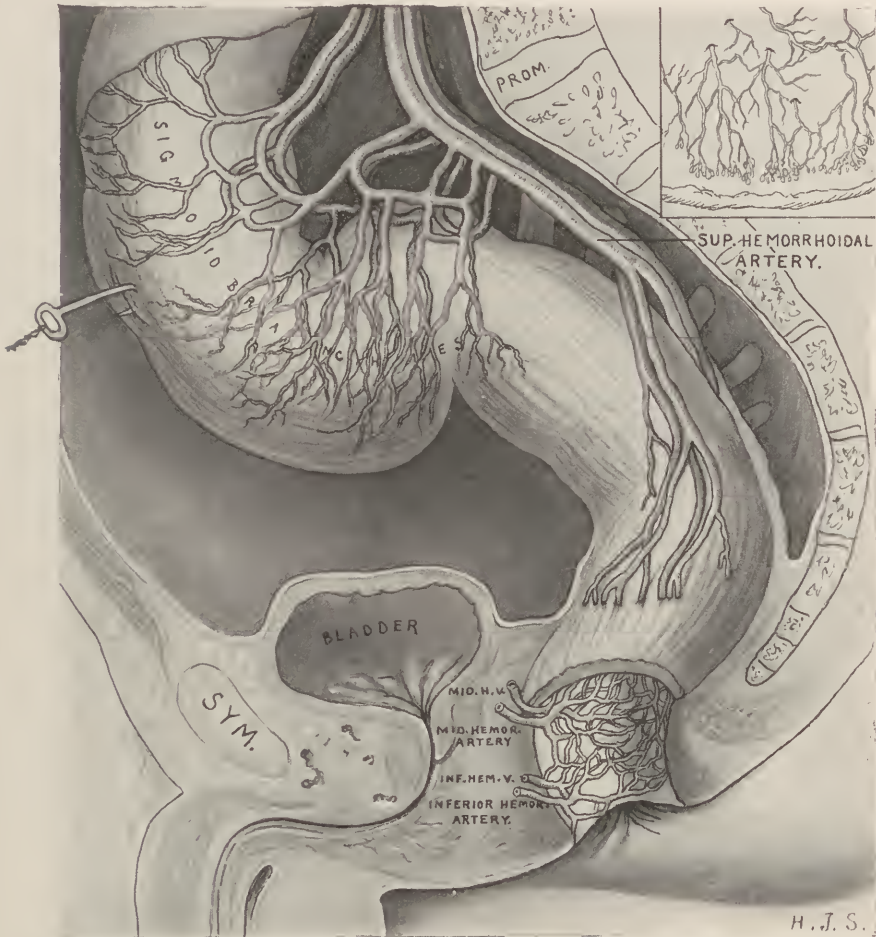


Fig. 300.—Showing blood-supply of the rectum and anus. Note the “hemorrhoidal plexus” of the anal canal, and in the insert the grape-like budding extremities of the hemorrhoidal vessels or beginning points of internal hemorrhoids.

of hemorrhoids. Quadrupeds are seldom if ever afflicted with piles, but dogs sometimes suffer from tumors at the anal margin resembling piles that are composed mainly of connective tissue and caused by irritation incident to buried spiculæ of bone.

Since the portal and hemorrhoidal veins do not possess *valves*,

the upright posture favors accumulation of blood in the hemorrhoidal plexus (Fig. 300), which, in turn, causes anorectal veins to become thin and sacculated or worm-like and later inflamed. The erect posture favors ptosis of the stomach, small intestine, colon, and abdominal organs, which interferes with portal circulation, causing enlargement and congestion of the rectal veins, and eventually venous hemorrhoids.

The superior hemorrhoidal vessels enter the rectum 3 inches (7.62 cm.) above the anus through *buttonhole-like slits* in the rectal musculature (Fig. 300), which, according to Allingham, serve as valves. Vernueil holds that the bowel contracts around and obstructs veins at such points leading to engorgement of the hemorrhoidal vessels and formation of hemorrhoids.

Gradually, as veins become varicosed, distinct hemorrhoidal sacs (Fig. 300) form between the mucosa and musculature, which as they increase in size dissect the former from the latter and project into the rectum or through the anus as ordinary venous or internal piles (Fig. 309).

*Anatomic defects*, such as narrowing of the anal canal, imperforate anus or rectum, membranous partitions and angulation of the rectum are predisposing causes of hemorrhoids, since they induce frequent and prolonged straining that leads to engorgement of the hemorrhoidal veins.

**Exciting Causes.**—The chief exciting factors in the causation of hemorrhoids enumerated in the order of their importance are: *Constipation, diarrhea, purgation, medication, dietary indiscretions, irregular and indolent habits, emotional disturbances, other anorectal affections, constitutional and disease in neighboring organs, hypertrophy and spasm of the levator ani or sphincter muscle, warm enemata, pregnancy, and parturition, friction, irritating suppositories, pessaries, anorectal injuries, excessive venery, pederasty, disease or injury of the spinal cord, tight lacing, and habitual straining at stool.*

*Constipation.*—Costiveness is the most frequent cause of hemorrhoids owing to delayed evacuations and accumulation of hardened fecal masses that block the bowel, compress hemorrhoidal vessels, traumatize the mucosa, and induce prolonged straining when evacuated.

Chronic constipation in addition to causing dilatation and congestion of rectal veins and piles invariably aggravates hemorrhoids already formed, which are daily bruised and dragged downward and made to protrude during defecation when stools are large, firm, and nodulated.

*Diarrhea* is an occasional factor in piles owing to accom-

panying frequent evacuations, prolonged straining, and congested state of the mucosa.

*Purgation and Medication.*—Purgatives, cathartics, and laxatives continuously taken often lead to the formation of varicosities in rectal veins owing to straining and irritation to the mucosa induced by them. Irritant drugs, colocynth, jalap, aloes, podophyllum, emmenagogues, ergot, cantharides, etc., occasionally prescribed, favor the formation of or aggravate hemorrhoids.

*Dietary Indiscretions.*—Gourmandizing, eating frequently at irregular hours, and partaking freely of alcoholic stimulants, iced and hot drinks are etiologic factors in proctitis and engorgement of rectocolonic capillaries, owing to their stimulating action on the mucosa. Radishes, onions, mustard, pepper, spices, aromatics, and highly seasoned dishes produce similar results; while cherries, corn, figs, berries, and fruit having non-digestible seeds mechanically irritate and cause congestion of the mucosa and adjacent vessels, but seldom induce hemorrhoids.

*Irregular and Indolent Habits.*—Carelessness in eating, laziness, and habitually neglecting to go to stool when a desire to empty the bowel is urgent are etiologic factors in external and internal piles.

*Psychic Causes.*—Excitement, fright, sorrow, and great joy are occasionally responsible for piles through inducing constipation, diarrhea, straining, and congestion of the hemorrhoidal plexus.

*Other Anorectal Affections.*—Catarrhal, tubercular, malignant, syphilitic, bacillary, amebic, balantidic, and other types of ulcerative coloproctitis are frequently complicated by thrombotic or cutaneous hemorrhoids incident to accompanying tenesmus and irritation caused by acrid discharges.

Venous hemorrhoids seldom arise from this source, but are often secondary to cancer, stricture, polyps, narrowing of the anus, and other anorectal diseases that obstruct the bowel, causing frequent and prolonged straining. Under such circumstances venous blood collects in veins of the hemorrhoidal plexus, with the result that pile tumors soon form.

*Constitutional Disease.*—Right-sided valvular heart lesions and congestion or cirrhosis of the liver are important factors in internal piles, since a back pressure in portal and hemorrhoidal veins ensues, which is relieved by the bleeding. *Nephritis* and congestion of the lungs are occasional complications of hemorrhoidal diseases, but are not causative factors in piles.

*Displaced or diseased organs* that press on hemorrhoidal, pelvic, or anorectal blood-vessels are sometimes responsible for varicosities in the lower rectum.



*Hypertrophy and Spasm of the Levator Ani and Sphincter Muscles.*—When either muscle frequently undergoes tonic contraction it causes constipation, straining during defecation, and constricts veins in the mucosa and submucosa leading to congestion and dilatation of venous, the plexus (Fig. 300), and formation of hemorrhoids.

*Frequent warm daily enemata* induce congestion and relaxation of the rectal mucosa which favors venous enlargement.

*Pregnancy and Parturition.*—Pregnancy mechanically leads to obstruction of portal and hemorrhoidal veins, and women not previously troubled frequently complain of piles before or immediately following delivery. Straining and stripping veins incident to passage of the child's head is often an exciting cause of *internal venous* and *external thrombotic* piles.

*Friction* from clothing, riding, running, and rowing has in rare instances led to the formation of thrombotic and cutaneous hemorrhoids.

*Suppositories* containing irritating ingredients cause congestion of the anal mucosa and tenesmus, and favor the formation of anorectal varicosities and hypertrophic changes in the perianal skin folds.

*Pessaries* sometimes produce hemorrhoids by causing constipation, obstructing veins, and irritating mucosa through pressure exerted by them.

*Anorectal injuries* are rare causes of thrombotic and cutaneous hemorrhoids, and the author has treated several cases induced by a fall, kick, introduction of defective enema tubes or instruments, foreign bodies, evacuation of impacted feces, and puncture wounds.

*Excessive venery* is said to have induced congestion and varicosities of hemorrhoidal veins, but the author has not observed hemorrhoids caused in this manner.

*Pederasty* has been responsible for thrombotic piles where introduction of the penis ruptured veins near the anus. The author treated a man for thrombotic hemorrhoids induced by rectal intercourse.

*Disease or injury to the spinal cord* is accompanied by relaxation of the anorectal musculature, constipation, fecal impaction, and straining, conditions favoring enlargement of rectal veins.

Tight lacing is also a contributing factor in hemorrhoidal disease. Finally, it may be said that any condition that induces habitual straining or congestion of superficial or deep vessels located in the anal canal may be a cause of hemorrhoids.



## CLASSIFICATION

Hemorrhoids, according to their location and coverings, are classified as follows:

1. *External*—visible—hemorrhoids covered by skin.
2. *Internal*—invisible—hemorrhoids covered by mucous membrane.
3. *Externo-internal*—combination—mixed hemorrhoids covered above by mucosa and below by skin.

Hemorrhoids have also been designated by physicians, nurses, or the laity as *hard, soft, burning, itching, weeping, protruding, bleeding, sticking, blind, inside, outside, red, blue, and constitutional piles*; all of which fall within the above classification.

## Chapter XXVIII

### Hemorrhoids (*Continued*)

#### EXTERNAL HEMORRHOIDS—THROMBOTIC, VARICOSE, CUTANEOUS

**General Remarks.**—*External* are encountered less frequently than *internal* hemorrhoids and are more easily cured; in many instances both types are met with in the same case. Generally external hemorrhoids are located outside the anal margin, but when large they may extend upward and apparently be partially covered by mucosa.

**Classification.**—External hemorrhoids are for clinical purposes divided into the *venous* and *cutaneous* types.

There are two kinds of *venous hemorrhoids*—*thrombotic* and *varicose*, and *cutaneous* piles may be subdivided into *redundant* and *hypertrophic* forms.

#### EXTERNAL THROMBOTIC HEMORRHOIDS

**Etiology.**—Thrombotic piles (Fig. 301) make their appearance suddenly during straining at stool, horseback riding, walking, violent exercise or lifting of heavy loads, and are frequently encountered in young or middle aged, robust individuals not having previously suffered from rectal trouble. This form differs from cutaneous piles in their sudden onset, acute pain, and quick disappearance. Occasionally thrombotic hemorrhoids are secondary to obstructing heart lesions, sclerosis of the liver, phlebitis, tumor, or anorectal disease that causes engorgement of the portal or hemorrhoidal veins and their tributaries (see Plate IV).

Constitutional disturbances and disease of veins may be a contributory factor in the production of thrombi in and external to veins, but in most instances thrombotic hemorrhoids are met with in active healthy individuals.

*Straining at stool* incident to constipation, fecal impaction, stricture, tumors, foreign bodies, worms, internal hemorrhoids, narrow anal canal, congenital anorectal defects, or anything that blocks or diminishes the bowel caliber may be considered a direct cause of external thrombotic hemorrhoids.

The author has treated cases where thrombotic tumors resulted from introduction of the proctoscope, speculum, finger, or hand

while the patient was being examined or treated; he has also handled persons suffering from venous or arterial thrombi induced by a kick, fall, or blow over the anus, and has observed patients similarly afflicted where blood-clots beneath the mucosa or skin were traceable to careless passage of pointed imperfect or broken syringe nozzles or evacuation of sharp-pointed or ragged foreign bodies.

**Pathology.**—There exists a difference of opinion regarding the pathology of thrombotic piles; some authorities claiming that thrombi form *within* and others *without* the veins.

The author's clinical experience and microscopic examination of slides prepared for the purpose have demonstrated to his satis-



Fig. 301.—Large thrombotic hemorrhoid.

faction that venous clots may form either in blood-vessels or collect in adjacent tissue subsequent to perforation or rupture of a hemorrhoidal vein or its offshoot.

Thrombi are comparatively rare within veins and are most often encountered beneath anal integument of individuals having phlebitis, sclerosis of vessels, or other disease that roughens or causes the internal coat to break. Where a thrombus is present in a vessel the tumor requires days to form, is small, rarely visible, and is not detected except through palpation.

The chief argument against thrombi in veins is they are not sufficiently large to accommodate the considerable amount of blood that distends the average thrombotic pile. Again, multiple thrombi

are encountered at different points, and it is unreasonable to suppose that all clots are formed at the same time in different vessels.

The author believes as a result of straining or direct injury a hemorrhoidal vein or its capillary is perforated or ruptured and blood escapes, to collect and form a thrombus in subcutaneous or submucous tissues adjacent or distal to the vein. When surrounding structures are compact a small tumor results because only a little blood can escape which coagulates and plugs the rent in the vessel; on the other hand, where mucosa or skin is loose considerable blood escapes, to form one or several small and large tumors (Fig. 308, *A*), or dissect its way downward, upward, or around the anal circumference, where it collects in diminutive and larger pools forming varying sized thrombi located below or above at Hilton's white line—anal margin. In no other way can the author account for dozens of clots that sometimes distribute themselves in and beneath the mucocutaneous covering within grasp of the sphincter muscle.

When a number of small and larger clots (Figs. 306, *C*, 308, *A*) are grasped in this manner adjacent skin and mucosa become inflamed, edematous, swollen and sensitive, and as a result thrombotic are frequently mistaken and operated for internal venous hemorrhoids. When numerous and scattered about the sphincter some are superficial, while other thrombi are deep and may be overlooked (Fig. 308, *A*).

Multiple thrombi are *high* and vary from millet to cherry-stone size, while single tumors are considerably larger—pea to lime size—and usually situated at or *below* the anal margin and be partially or entirely covered by mucosa, skin, or both (Fig. 301).

Newly formed thrombotic hemorrhoids have a purplish hue resembling a blue grape or bullet beneath the skin (Plate IV), are firm, movable, and very sensitive, and gradually increase in size, or new tumors form unless bleeding is arrested. Untreated thrombi begin to diminish after forty-eight hours and may be completely absorbed within one or two weeks unless they become infected, terminating in marginal abscess (Fig. 220).

Occasionally clots become organized or calcified and remain indefinitely, causing pain and constipation, or lead to stretching and thickening of overlying skin and formation of permanent *skin-tabs*, which also may be left following absorption or enucleation of the clots.

Owing to proximity of hair follicles, sebaceous glands, and contained septic organisms thrombotic hemorrhoids frequently become infected and small or large *abscesses* form.



Unevacuated clots that are not absorbed stretch the skin or mucosa, which ulcerates, permitting the thrombus to extrude part way through the opening (Fig. 305), or overlying integument sloughs away when the clot and retained uncongested dark blood escape.

**Symptoms.**—Ordinarily thrombotic hemorrhoids suddenly appear following the evacuation of hardened feces, straining from any cause, or lifting a heavy load. In the beginning there is a pricking or uneasy sensation at the anus, later, as bleeding continues, the clot enlarges, skin tension is increased, and the patient complains of pain, swelling, and annoying sphincteralgia.

Acutely inflamed tumors are hypersensitive and cause considerable pain, sphincteric irritability, constipation, painful defecation, and prevent the sufferer from obtaining rest or sleep in any position.

Suffering gradually subsides within forty-eight hours as the clot is gradually absorbed. Where tension is marked overlying skin ulcerates or sloughs and the clot is evacuated through the opening, which is immediately followed by subsidence of symptoms other than a dark bloody discharge. Pruritus ani is troublesome when the tumor presses on superficial nerves; when the clot becomes encysted it causes discomfort and slight tenderness on pressure.

Septic organisms from hair follicles and sebaceous glands often infect thrombi, causing the formation of marginal or larger abscesses, symptoms of which are inertia, loss of appetite, chilly sensations, sudden high temperature, increased tenderness, continuous throbbing pain, and sphincteric irritability.

Hemorrhage seldom complicates thrombotic hemorrhoids, but clotted dark fluid—uncongested blood and serum—escapes subsequent to breaking down of the pile; nearly all pain disappears with absorption or ulceration and spontaneous evacuation of the clot.

**Diagnosis.**—Thrombotic are easily distinguished from other hemorrhoids by their sudden onset, hardness, ovoid shape, bluish hue (Fig. 303), hypersensitiveness, and accompanying acute pain and sphincteralgia.

When a clot is intravenous it forms slowly and discomfort is slight and gradually increases, but when a thrombus forms outside a perforated or ruptured vein beneath mucosa or skin the tumor appears almost instantly, causing acute pain and sphincteralgia.

**Treatment.**—The treatment of thrombotic hemorrhoids is *prophylactic, palliative, or surgical*.

**Prophylactic Treatment.**—Thrombotic hemorrhoids recur unless factors responsible for them are removed. Repetition of the trouble can sometimes be obviated by having the patient live an

active out-door life, maintain regular hours for eating, sleeping, and attending to calls of nature, stop gourmandizing, consuming highly seasoned or food that leaves a large dry residue, and drinking alcoholic beverages, all of which favor engorgement of anorectal veins.

Obstructive heart lesions, sclerosis of the liver, and phlebitis require attention and tumors or disease in neighboring organs that press upon or lead to engorgement of the portal vein must be corrected.

The chief factor in anal thrombi is persistent straining during stool, hence the prophylactic treatment of thrombotic hemorrhoids must include the elimination of anorectal defects, benign and malignant tumors, strictures, spasmodic contractions of levator ani muscle, internal hemorrhoids, constipation, ulcers, fecal impaction, and fissures or other condition that delays or interferes with the passage of feces causes straining or prolonged or painful defecation.

**Palliative—Non-operative Treatment.**—Palliative measures, since they are not curative, are contraindicated in the treatment of thrombotic hemorrhoids except when the patient declines surgical interference or is being prepared for operation. Under these circumstances patients are kept comfortable by having them eat lightly, take laxatives to render movements semisolid, rest quietly in bed, apply hot lead and opium, boric acid, hydrastis, or carbolic acid fomentations to the anus and buttocks, which relieve sphincter-algia and shrink tumors.

Pain incident to skin tension and sphincteric spasm is minimized or eliminated with hot sitz-baths and suppositories containing morphin or cocain, gr.  $\frac{1}{4}$  (0.016), in combination with belladonna, gr.  $\frac{1}{4}$  (0.016), which lessens muscular irritability, arrests pain, and enables the patient to obtain sorely needed rest and sleep.

Cold applications, ice-packs, and astringent ointments frequently prescribed rarely relieve pain and sphincteric spasm or hasten absorption of the clot. Painting the hemorrhoid with a mixture of glycerin and creolin and keeping the parts clean hastens clot absorption and minimizes danger of infection. Occasionally a hypodermic of morphin is required to relieve excruciating pain incident to defecation or sphincter-algia.

Lead and opium as combined in the accompanying prescription make a dependable fomentation for the treatment of thrombotic piles:

R.	Liquor plumbi subacetatis.....	℥iv	150;
	Tincturæ opii.....	℥iiss	100;
	Aqua destillatæ.....q.s. ad.	℥iv	1200.—M.

Sig.—Heat and apply constantly on cotton or gauze.

This wash or fomentation may be used alone or alternately with one of the following ointments, which when applied to the anal canal with finger or pile-pipe (Fig. 192) quickly controls pain and sphincteralgia:

Ry.	Ungt. stramonii.....	℥ <sup>iss</sup>	6 0;
	Ungt. belladonnæ.....	℥ <sup>iiss</sup>	10 0;
	Ungt. acidi tannaci.....	℥ <sup>ss</sup>	15 0.—M.

Sig.—Use in and outside the anus.

Ry.	Bismuthi subnitras.....	℥j	4 0;
	Morphinæ sulphas.....	gr. vj	0 4;
	Hydrargyri chloridum mite.....	gr. xij	0 8;
	Petrolatum.....	℥j	30 0.—M.

Sig.—Apply freely within the anus and to hemorrhoids with fingers or through a pile-pipe.

Ry.	Ext. opii.....	℥ <sup>ss</sup>	2 0;
	Cocainæ hydrochloricum.....	gr. x	0 6;
	Menthol.....	gr. xx	1 3;
	Ungt. zinci oxidi.....	℥j	30 0.—M.

Sig.—Apply to sphincter and inflamed tumors.

When non-operative measures fail to bring quick relief they are abandoned and the clot or thrombi are promptly enucleated.

**Surgical Treatment.**—Time is not wasted with palliative measures unless the patient's consent cannot be obtained for an operation, because more can be accomplished with surgery in five minutes than is gained by non-operative treatment in weeks.

Surgical intervention is not objectionable because elaborate preparations are unnecessary, the operation is painlessly performed in five minutes under eucain anesthesia, does not confine the patient to the house, postoperative pain is slight, and a prompt cure invariably follows incision and evacuation of the clot and draining the wound.

The patient is made ready for operation by a small soapsuds enema, swabbing the anal canal and buttocks with an antiseptic, painting the hemorrhoid with surgical iodine, making the subject comfortable in the left Sims' posture, and administering morphin, gr.  $\frac{1}{4}$  (0.016), hypodermically to control postoperative pain and sphincteralgia.

Each pile is then anesthetized by infiltrating it and overlying skin with a eucain  $\frac{1}{8}$  per cent. solution or novocain until blanched, which indicates complete desensitization of the pile, pain from initial introduction of the needle being eliminated or minimized by pressing overlying integument between finger and thumb or touching it with carbolic acid.

The anesthetic is first injected between skin layers and then directly into the pile center with assurance that it will be effective

in less than twenty seconds. The amount of solution required varies from 3 drops to a teaspoonful, depending on the size and number of hemorrhoids to be operated on.

*Technic.*—Thrombotic hemorrhoids may be speedily cured by either the *incision* or *excision* operations.

*Incision Operation.*—This procedure consists in transfixing the pile at its base and parallel to the long axis of the bowel (Fig. 302), following which the tumor is laid wide open with a sharp-pointed curved bistoury (Fig. 303) by a single cut (Fig. 303). The clot is easily extruded by pressure made with the thumb-nail when fresh, but when old and organized a curet (Fig. 303) or scissors is needed for its removal. Some surgeons are content with this, but the author trims off overhanging skin edges and packs the pile cavity with a



Fig. 302.—Photograph of thrombotic pile infiltrated with eucaïn and about to be incised and the clot evacuated.

narrow twisted gauze strip to arrest bleeding and prevent infection (Fig. 304). When this precaution is not taken wound edges quickly unite through being held together by the sphincter, bleeding continues, and a new clot forms that may be larger than the original thrombus, or the wound becomes infected, terminating in a diminutive or large abscess. If the integument overlying a large clot is inflamed or stretched a strip of tissue is removed on either side of the incision (Fig. 304); otherwise a cutaneous hemorrhoid or skin-tab is left to annoy the patient after healing takes place.

Multiple, large, movable thrombotic hemorrhoids are, in turn, operated in the same way, but when numerous small and large thrombi are distributed around the anal circumference (Fig. 308, A) *individual* cuts are impracticable, and lengthy, superficial, semi-circular or deep incisions are required that all loose and encysted



thrombi may be evacuated with the curet. In aggravated cases where tissues are inflamed, swollen, edematous, and variable in size, or clots are partially organized, encysted or widely scattered, an

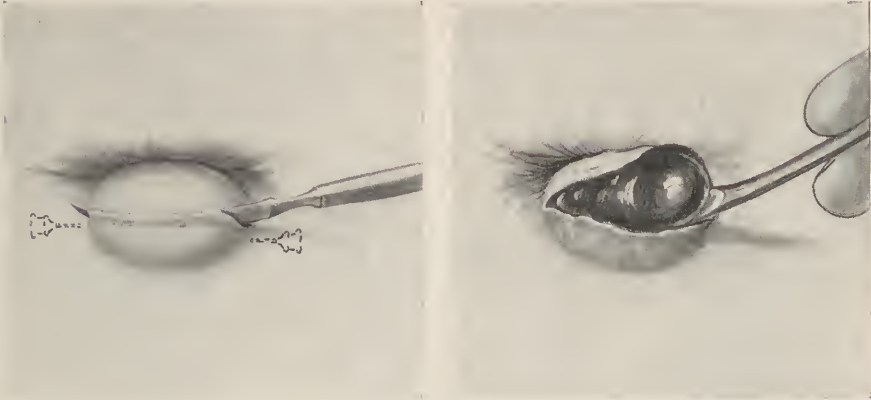


Fig. 303.—External hemorrhoid containing a large single clot being laid open with curved bistoury following anesthetization with eucain. Clot being evacuated with curet.

extensive operation necessitating considerable patience and ingenuity is necessary to immediately relieve the patient and avoid permanent injury to the sphincter muscle.

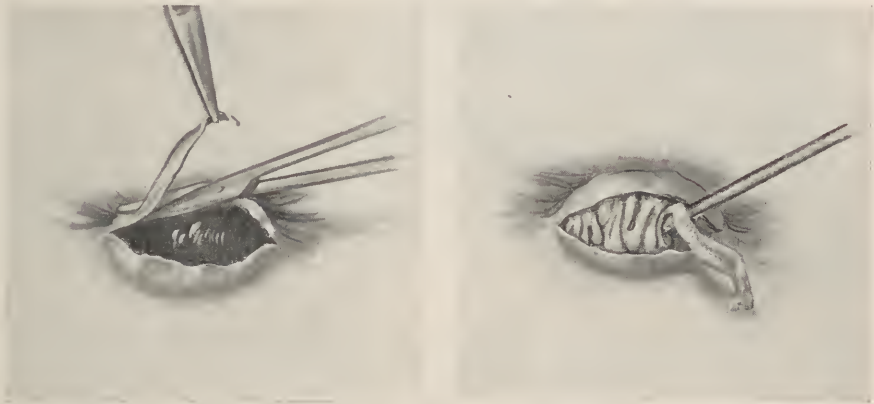


Fig. 304.—Overhanging skin edges being removed with scissors to prevent subsequent formation of skin-tag. Cavity of tumor lightly packed with gauze to arrest bleeding and forestall a second clot.

Wounds made in thrombotic hemorrhoidal operations seldom become infected and heal quickly when superfluous skin and mucosa are excised and the incision is cleansed and drained once or twice daily.

**Excision Operation.**—Excision possesses no advantage over the incision operation, but is popular with surgeons irrespective of the fact that *closed* become infected very much more frequently than *open* anorectal wounds.

**Technic.**—In this procedure following anesthetization of the skin and deeper structures with eucain or cocain the tumor (Fig. 308, *C*) is seized with forceps and removed by an elliptic incision made with knife or scissors. When the clot is organized and does not come away readily it is removed with a sharp curet or dis-

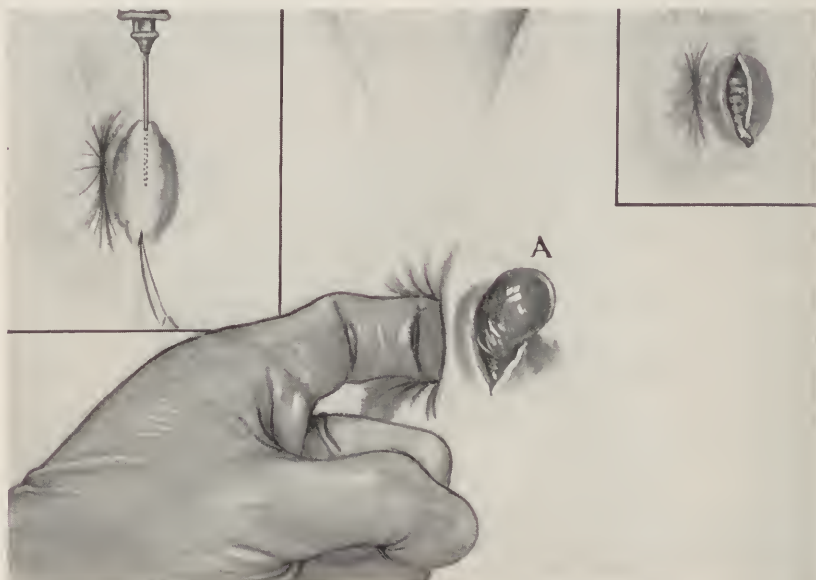


Fig. 305.—Technic of anesthetizing and incising a thrombotic pile, insert (left): *A*, Thrombus extruding through incision with finger introduced into the anus canal. Insert (right) shows cavity of hemorrhoid distended with gauze drain to prevent further bleeding after skin edges have been trimmed away.

sected out with scissors. Bleeding is controlled with hot-water compresses or ligatures, following which the wound is dressed and permitted to heal by *granulation* or sutured and drained (Fig. 308, *C*) when *primary union* is sought (Fig. 308, right insert).

Wounds following incision and excision operations are cleansed daily with an antiseptic solution and covered with gauze to avoid infection and prevent irritation by clothing.

**External Varicose Hemorrhoids.**—Varicose external piles are rare, but have been encountered in children, adults, and very old persons.

This condition manifests itself gradually, is usually associated with procidentia recti, obstructing lesions or anorectal affections accompanied by constipation, straining at stool, or sagging of the mucosa, and independently they cause little discomfort other than a sensation of fullness and uneasiness about the anus during defecation.

These piles contain little or no connective tissue, but appear as *tortuous* or *pouch-like dilated veins near the anal margin*, and may be invisible except during defecation. Varicose external hemorrhoids are usually accidentally discovered when the patient is being examined for constipation or some other anorectal affection. These turgescent, worm-like, pouched, or enlarged veins disappear on cessation of straining and when the patient assumes a recumbent posture.

**Treatment.**—External varicose hemorrhoids cause but little annoyance and are rarely recognized or treated except when associated with some other disease.

They are seldom cured, but are reduced in size by rest, applications of the ice-pack, and astringent—ox-gall or suprarenal extract, ointments or lotions made to the anus, securing daily semisolid evacuations, and correcting conditions responsible for persistent straining.

Operation is seldom justified, since *varicose* external hemorrhoids are enlarged veins that do not *assume tumor formation*, cause little discomfort, and when eradicated newly formed veins soon become dilated unless the original cause is removed. If when operating for other anorectal diseases enlarged anal and perianal veins are observed the author destroys them with Paquelin cautery, dissects them out and sutures the wound, or ligates and excises them *en masse*.

Occasionally they are made to disappear by electrolysis through repeatedly introducing and leaving a red-hot needle in the varicosities for a short time.

**External Cutaneous Hemorrhoids.**—Connective tissue—cutaneous hemorrhoids (Fig. 306, *B*)—skin-tabs (Fig. 306, *D*) located at the anal margin and covered with skin are devoid of the vascular elements composing varicose and thrombotic external piles.

Cutaneous hemorrhoids may be single or multiple and appear as elongated, ovoid, clubbed (Fig. 306, *B*), polypoid-like (Fig. 306, *D*), or irregular tabs located at the margin or in close proximity to the anus (Fig. 306). They present as normal, purplish, soft, *redundant* skin folds—tabs, or as firm, whitish, hypertrophic connective-tissue tumors differing in contour (Figs. 307, 308); and when

numerous, hypertrophied, inflamed, or edematous they occasionally conceal the anus.

**Etiopathology.**—The etiology of cutaneous hemorrhoids (Fig. 308, *B*) varies in different cases. Hypertrophic changes in perianal skin may result from many of the causes enumerated in the general etiology of internal hemorrhoids. Typical connective-tissue piles and pendulous skin-tabs are usually secondary to cancer, stricture, fissure, ulcerated internal piles, rectal catarrh, ulcerative coloproctitis, fistula, cryptitis, rectocolonic, or other disease accompanied by an acrid discharge that keeps the perianal skin irritated, which leads to hypertrophic changes in the integument.

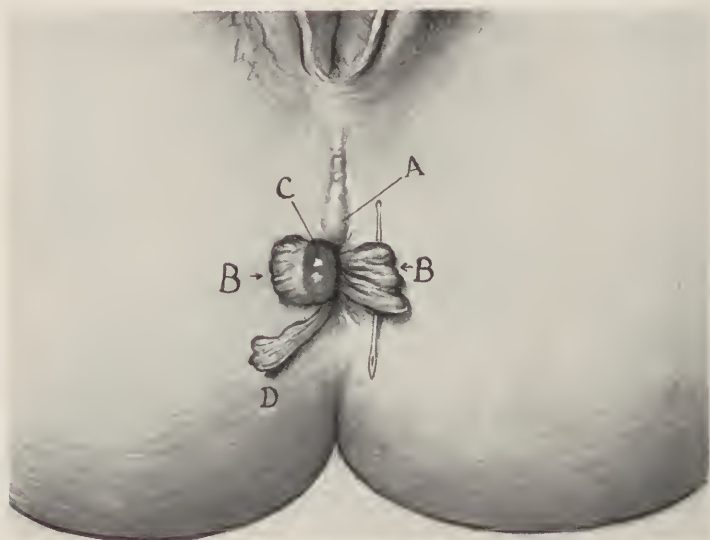


Fig. 306.—External, cutaneous, and combination hemorrhoids: *A*, Hypertrophied perineal rugæ; *B*, cutaneous hemorrhoids; *C*, combination pile; *D*, skin-tab—polyp.

Multiple, long, and irregular-shaped tabs with excoriation of the buttocks are a sure indication of serious rectal disease. Other important factors in the causation of cutaneous hemorrhoids are constipated stools, careless introduction of enema tubes, finger, hand, speculum, proctoscope or other instrument, evacuation of foreign bodies, thrombi, stretching the skin, blind internal fistula beneath the integument, pinching or bruising the parts during defecation, sphincteric divulsion, rectal operations, and pruritus ani that leads to hypertrophic changes in the skin the result of scratching. Connective-tissue piles may be caused by puncture wounds, carbolic injection treatment of hemorrhoids, or treatment of rectal lesions with acids or the cautery.



**Symptoms.**—Loose skin-tabs and large connective-tissue piles may remain quiescent indefinitely, but when bruised, ulcerated, or inflamed quickly enlarge, become sensitive, edematous, and induce acute pain, sphincteralgia, constipation, painful defecation, and render the patient miserable in any position he may assume. Cutaneous hemorrhoids seldom become infected, ulcerated, or gangrenous, and when swollen shrink up gradually when the source of irritation is removed and inflammation subsides.

**Treatment.**—Temporary relief from pain and sphincteric irritation is obtained with applications of ice, cold astringent solutions—alum, zinc, ichthyol, or oak bark—and antiphlogistic agents that diminish congestion and cause shrinking of tumors. During acute attacks patients are more comfortable when kept in bed and are given mineral oil, cascara, salts, or laxative mineral water night or morning to procure regular soft evacuations.

Pain and sphincteralgia not controlled in the above manner are relieved by the occasional introduction of suppositories containing morphin or cocain, gr.  $\frac{1}{8}$  (0.008), and belladonna extract, gr.  $\frac{1}{4}$  (0.016), reinforced by hot fomentations to allay postdefecatory discomfort. The accompanying formula may be satisfactorily employed for the same purpose:

Rx. Suprarenalum ext.....	℥ss	20;
Morphinæ sulphas.....	gr. vj	04;
Ungt. stramonii.....	℥iss	60;
Ungt. belladonnæ.....	℥iiss	100;
Ungt. acidi tannici.....	℥ss	150.—M.

Sig.—Apply in and outside the rectum three times daily with finger and pile-pipe.

Palliative measures shrink up, but never cause fully developed external cutaneous hemorrhoids to completely disappear.

**Surgical Treatment.**—The author makes it a practice to excise connective-tissue piles providing the patient's consent to operation is obtained and sees no advantage in waiting until acute symptoms subside, as is advised by some surgeons. The same preparation made for thrombotic is carried out for operations on connective-tissue piles, which are always removed under *local anesthesia* in the office unless numerous and large, when the patient is sent to the hospital for a day or two.

**Technic.**—Tumors are infiltrated (Fig. 307) with a eucain solution until white (Fig. 307), which denotes complete anesthesia. Each pile is in turn caught with forceps, drawn downward, and excised by a V-shaped or elliptic incision (Fig. 308, insert) pointing at the anal margin (Fig. 308). The cuts are made with knife or scissors and the V has advantages over straight and elliptic incisions

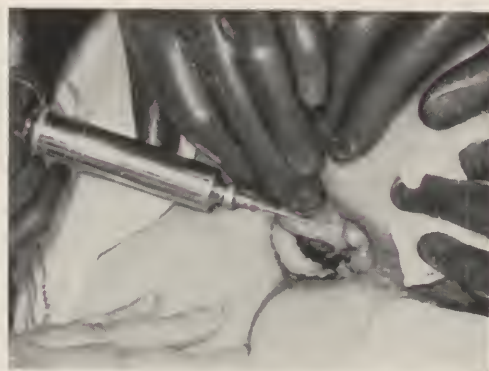


Fig. 307.—Anesthetizing external cutaneous hemorrhoids for excision.

in that it is wider externally and takes up the slack in relaxed perianal skin as the wound heals.

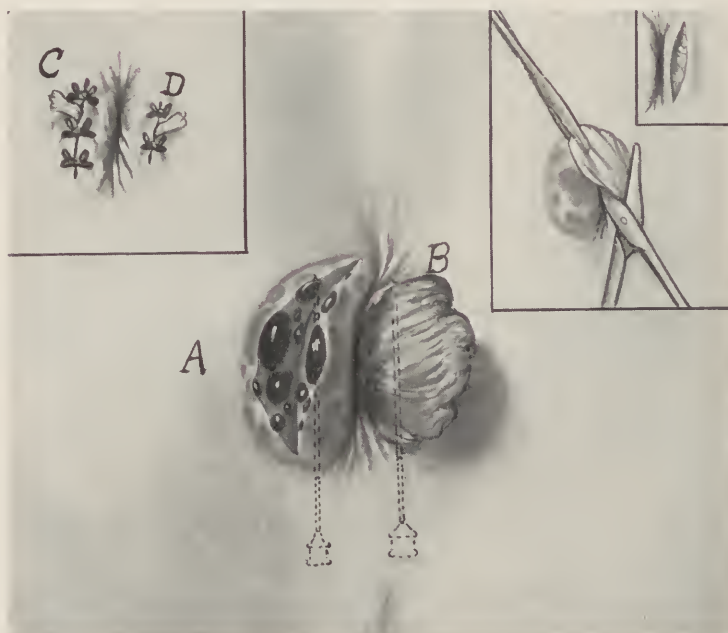


Fig. 308.—External thrombotic and cutaneous hemorrhoids: *A*, Thrombotic pile being excised, clots evacuated with curet; *C*, wound drained and sutured; *B*, cutaneous hemorrhoid excised; *D*, wound closed and drained. Insert in right upper corner shows wound left to heal by granulation after removal of cutaneous pile with scissors.

The author permits such wounds to heal by granulation (Fig. 308, insert), but some operators suture them (Fig. 308, *D*) to obtain primary union, which is bad practice, since stitches cause un-

necessary suffering and closed wounds often become infected, resulting in abscess, fistula, or both.

*Postoperative* treatment consists in keeping the anus and buttocks clean, covering the wound with gauze, and preventing hardened evacuations.

When connective-tissue piles—skin-tabs—are complicated by pruritus ani and hypertrophied radiating skin folds care is exercised to avoid too much integument, otherwise stricture may form and cause greater annoyance than the hemorrhoids.

## Chapter XXIX

### Hemorrhoids (*Continued*)

#### INTERNAL HEMORRHOIDS

#### INTERNAL VARICOSE, VENOUS HEMORRHOIDS, EXTERNO-INTERNAL—COMBINATION HEMORRHOIDS

**General Remarks.**—Internal hemorrhoids are common and the majority of adults suffer from them before they reach their fiftieth year. A study of the author's statistics (p. 424) shows that internal hemorrhoids are rare in infancy and childhood. Tumors of this type are encountered more often in men than women and during active periods of life (see Plate V).



Fig. 309.—Typical appearance of protruding bleeding internal hemorrhoids with erosions and ulcers.

Internal hemorrhoids are common in all countries and climates, met with in different races, attack persons in all stations of life and those following sedentary and active occupations, and afflict robust or debilitated individuals with equal frequency.

Internal hemorrhoids cause annoyance or considerable mental and physical suffering when they bleed, protrude, or become ulcerated (Fig. 309) or strangulated, but seldom terminate fatally unless they degenerate into cancer or ulcerate into a large vessel and bleed



PLATE V



Multiple large protruding internal hemorrhoids surrounded by hypertrophied perianal skin folds. Note enlarged anal papilla on either side.



copiously, causing anemia, exhaustion, or death, which occurs more often than the profession is aware of.

The author treated 2 diabetic patients who came near dying from strangulated, gangrenous tumors, and others where internal hemorrhoids were the initial cause of wide-spread, deep burrowing, or phagedenic ulceration complicated by septicemia or abscess, who were desperately ill, the result of hemorrhage, exhaustion, or septic foci throughout the body. He also treated 2 patients that died from *edema of the lungs* due to sloughing of submucous and subcutaneous structures caused by the injection of internal hemorrhoids with carbolic acid made by advertising pile doctors. Deaths from *portal pyemia* secondary to thrombosed internal hemorrhoids have been reported, and Mummery has registered a death caused by septicemia incident to sloughing piles. Embolism terminating fatally is a frequent complication of thrombosed varicose veins of the leg, but death from thrombosed hemorrhoidal veins is rare because an embolism in such cases necessarily travels through the portal circulation to the liver.

Many individuals afflicted with internal hemorrhoids are but slightly inconvenienced, and in consequence defer examination and treatment for months or years.

Internal piles are covered with mucosa and located just above the anus at Morgagni's columns or elsewhere in the anal canal, but are never encountered above in the rectal ampulla.

Venous internal hemorrhoids may be arterial, venous or mixed, globular, tortuous, or oblong in shape (Fig. 312), vary in number from one to seven (Fig. 312), have a bright red, purplish, or bluish tint (Fig. 309), remain above the sphincter or protrude through the anus (Fig. 313), and have a slightly pedunculated or broad attachment.

*Classification and Pathology.*—Many types have been described, but from a clinical viewpoint there are only three types of *internal piles*—*thrombotic*, *capillary*, and *varicose*—venous. Another variety—*interno-external*, *mixed*, or *combination piles*—is discussed in connection with internal hemorrhoids since they cause like symptoms and require similar treatment.

**Thrombotic Internal Hemorrhoids.**—These rare tumors result from the formation of blood-clots in the hemorrhoidal veins or perivascular tissue and resemble external thrombotic piles frequently encountered except in their higher position and location of clots beneath the mucosa instead of skin (Fig. 310, C).

Internal are generally more numerous and show less tendency to become encysted than external thrombotic piles, rarely result in

abscess, and cause less pain and sphincteralgia owing to their being located above the anal muscle.

Internal thrombotic hemorrhoids are generally encountered in persons afflicted with venous internal piles, constipation, or an affection of the rectum complicated by prolonged straining that causes perforation or rupture of one or more veins or its radical. These tumors are variable in size, ovoid in shape, bluish in color, movable, and look somewhat like a bullet buried beneath the mucosa.

**Treatment.**—The *treatment* for thrombosed *internal* is practically the same as for *external* thrombotic piles outlined in Chapter XXVIII, except incisions are made through mucosa instead of skin.

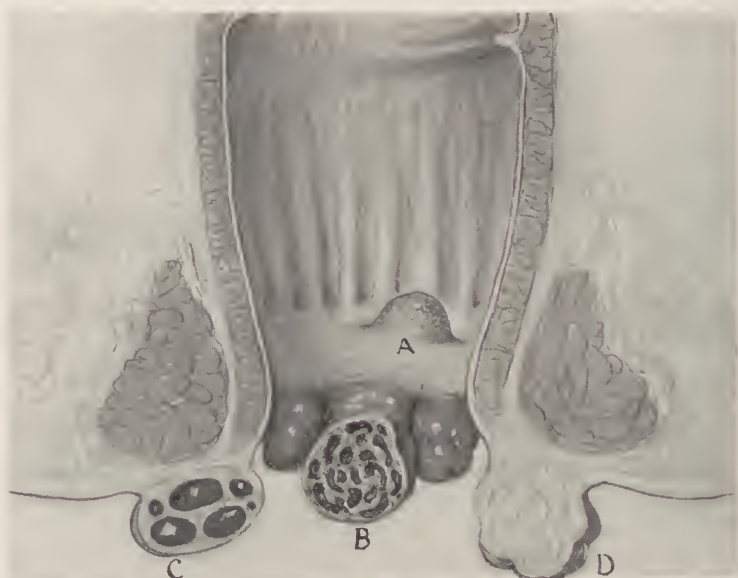


Fig. 310.—Schematic drawing showing different types of hemorrhoids: *A*, Capillary—strawberry, internal hemorrhoid; *B*, venous internal hemorrhoid; *C*, thrombotic external hemorrhoid; *D*, cutaneous external hemorrhoid.

**Capillary Internal Hemorrhoids.**—Capillary, often designated “nevoid” or *strawberry* hemorrhoids (Fig. 310, *A*), are small, usually single (Fig. 310), encountered very much less frequently than internal varicose—venous—piles, and are seldom associated with other varieties of hemorrhoids, though they sometimes degenerate into varicose tumors. Strawberry piles are slightly raised—plaque-like—have an uneven—punctate—soft, or spongy surface, bright red in color, vary from cherry seed to large raspberry size, rarely encountered in children, seldom protrude, and when brought into



view by everting anal margins resemble a small strawberry because of their color and numerous punctate openings dotting their surface.

Some authorities regard them as *nevi*, which is a mistake, since the latter are congenital and the former develop during active periods of life and are induced by proctitis, rectal ulceration, or irritable anal canal that keeps the mucosa congested, moist, and swollen. The surface of capillary hemorrhoids simulates a granulated eyelid, and when extruded, squeezed by the fecal bolus during defecation, or compressed between fingers blood oozes through numerous pinpoint openings in diminutive cone-shaped depressions.

These hemorrhoids situated near the anus have a thin, fragile, epithelial covering, are composed of intermingling venous or arterial capillaries in the mucosa, and bleed daily from slight provocation, though hemorrhage from them is never alarming.

Sometimes as a result of continued irritation, infection of the punctate openings, congestion of the rectal mucosa, and straining new connective tissue forms about capillary piles and submucous veins, and they degenerate into true varicose hemorrhoids, or a spontaneous cure occurs when the inflammatory processes obliterate their supporting venous or arterial capillaries.

**Symptoms and Diagnosis.**—Capillary hemorrhoids bleed daily, bright red blood being seen as streaks or drops on feces or smears on toilet paper. Hemorrhage is never profuse, but anemia follows when bleeding is permitted to go on for months or years.

Acute pain is never a manifestation of *nevoid* or strawberry piles, but individuals having capillary hemorrhoids sometimes complain of uneasy smarting or itching sensations at or near the anus caused by collection of mucus in the anal canal or perianal skin folds.

**Diagnosis.**—Capillary hemorrhoids are readily *diagnosed* by their spongy, bright red, indentated surface or strawberry-like appearance. Pressure makes them temporarily disappear and straining or squeezing tumors causes bright red blood to exude through their thin covering of mucosa at several points. They rarely protrude, but are easily located as single tumors through the anoscope, slide speculum, or by everting anal margins with the thumbs.

**Treatment.**—Capillary hemorrhoids are obliterated under *local anesthesia* in five minutes without confining the patient to bed, as in the *ligature-cautery* operation elsewhere recommended for the cure of *venous internal* hemorrhoids.

Physicians often attempt to destroy capillary piles with acids, but the practice should be abandoned because these agents destroy both diseased and healthy tissue, causing an ulceration more diffi-

cult to cure than piles. The author has succeeded in destroying capillary hemorrhoids with fulguration or by puncturing and burning them with a Paquelin or an electric cautery point after they had been infiltrated with a eucain solution,  $\frac{1}{8}$  per cent. He has also succeeded in arresting hemorrhage from or shrinking these tumors by injecting them with a weak solution of carbolic acid of 6 per cent. or quinin urea, 8 per cent., used after the plan described elsewhere.

Where the patient declines operative interference, the cautery, and injection treatment, bleeding is temporarily or permanently controlled by prescribing laxatives to soften evacuations and prevent straining at stool and introducing a pledget of gauze soaked in ichthyol or balsam of Peru (10 per cent.) into the rectum daily after the bowel has been emptied and swabbed with an antiseptic. Astringent and sedative ointments are objectionable because they tend to macerate the mucosa and delay instead of facilitating a cure.

When proctitis is troublesome it is relieved by irrigating the rectum three times weekly with the following combination:

R̄.	Fl. ext. krameria . . . . .	℥iv	1200;
	Sodium baborate . . . . .	℥ij	20;
	Warm water . . . . .	℥j	5000.—M.

**Interno=external or Mixed Hemorrhoids.**—Combination or mixed piles (Fig. 311) consist in a blending of *internal* with *external* hemorrhoids at the mucocutaneous juncture—Hilton's white line (Fig. 306, C). There is usually a depression at this point and the segment of tumor above has a *mucous* covering containing varicose radicals of the hemorrhoidal veins, while the segment external to the anus is covered by *skin* and composed chiefly of connective tissue; the internal possesses characteristics of venous—varicose—while the external segment of these tumors resembles *cutaneous* or connective-tissue hemorrhoids.

Combination tumors originate as internal varicose piles which enlarge, separate the mucosa from the muscular tunic, and form baggy swellings that are caught by feces and pushed downward daily during defecation. In time the skin and blending flabby mucosa, as a result of daily dragging upon them, stretch, break loose, and in conjunction with associated varicose veins forms a large soft swelling located partly *outside* and partly *inside* the anus. Blood-vessels of the upper segments of mixed hemorrhoids anastomose freely (Fig. 311).

**Symptoms.**—The manifestations of combination include symptoms of both varicose *internal* and *external* cutaneous hemorrhoids,

and in aggravated cases the patient suffers from bleeding, pain, and protrusion of the tumors. Mixed piles, owing to their location,



Fig. 311.—Microscopic appearance of a sectioned externo-internal—combination—hemorrhoid.

tease and keep the sphincter irritable and are accompanied by a slight discharge of mucus that excoriates the skin and causes pruritus ani.

**Diagnosis.**—Combination hemorrhoids are easily distinguished by their location and coloring, which is of a reddish-purple above and pinkish-white hue below Hilton's white line (Fig. 312). In fact any tumor that is covered internally by mucosa and externally by integument is a combination or interno-external hemorrhoid.

When there are *venous* on one side and *cutaneous* hemorrhoids on the other side of the anus they are not classified as *mixed* piles, since they do not blend or resemble each other.

**Treatment.**—Interno-external are treated the same as *venous* or *varicose* internal hemorrhoids except a liberal V-shaped segment of integument is removed to take up slack in the skin and remove the



Fig. 312.—Large protruding ulcerated internal and mixed or combined hemorrhoids.

excess of connective tissue. Hence the palliative, non-operative, and surgical treatment of combination piles has been considered in connection with that of protruding internal hemorrhoids.

**Varicose—Venous—Internal Hemorrhoids.**—As their name implies, internal varicose hemorrhoids are covered with mucosa and located above the anus in proximity to Morgagni's columns. Large and small, single or multiple varicose tumors may be encountered anywhere in but never above the anal canal, though rectal veins higher up are occasionally enlarged.

Venous piles are dark bluish or reddish-purple in color, vary in number from one to seven—most often three to five—and from grape to pullet egg-size; are ovoid or oblong in shape, have a smooth or



uneven *surface*, and broad *base* except when they have prolapsed daily for years and become pedunculated, and may extrude through or remain above the sphincter during and in the interval of defecation (Figs. 312, 313).

Internal venous hemorrhoids present as individual tumors separated by narrow connective-tissue strips (Fig. 312) or broad areas of mucosa, and when multiple there is usually a large on one and moderate sized pile on the other side of the anus and two smaller tumors located at the anterior and posterior anal margins, any or all of which may protrude during defecation (Fig. 313).

In aggravated cases the anal margin is everted during defecation (Fig. 315), and hemorrhoids that prolapse sooner or later ulcer-



Fig. 313.—Multiple large protruding internal hemorrhoids complicated by external edematous piles, skin-folds, and tabs: *A*, Front view; *B*, side view.

ate, bleed or become inflamed, indurated or edematous, and remain outside the anus continuously, and promptly extrude when returned above the sphincter (Fig. 315).

Varicose or venous hemorrhoids possess erectile tissue which enables the patient to voluntarily extrude and then draw them back above the sphincter. Following perforation of these tumors by an ulcer or puncture during operation escaping blood may be dark or bright red and flow steadily or in spurts, and because of this different authorities claimed internal hemorrhoids may be *venous*, *arterial*, or composed of radicals from both veins and arteries. Usually, however, piles—except capillary—are venous, and when blood escapes in spurts it is usually caused by pressure incident to straining or contraction of anorectal muscles.

**Etiology.**—The predisposing and exciting causes of hemorrhoids in general having been enumerated and discussed in Chapter XXVII the author will now briefly consider the chief etiologic factors in *varicose*—venous—internal hemorrhoids only, and point out the manner in which they lead to enlargement of hemorrhoidal veins and the'r radicals (Fig. 314). Without knowledge of the vascular system of the rectum (Fig. 300) it is impossible to understand the etiology and pathology of internal piles.



Fig. 314.—Showing vascular supply of internal hemorrhoids: *A*, Superior hemorrhoidal veins; *B*, middle hemorrhoidal veins; *C*, inferior hemorrhoidal veins; *D*, hemorrhoidal plexus membrane; *E*, protruding internal hemorrhoids covered by mucosa.

Small branches of the *superior* anastomose with those of the *inferior* hemorrhoidal veins in the lower  $1\frac{1}{2}$  inches (3.81 cm.) of the rectum about Morgagni's columns, and these intervening radicals, composing the hemorrhoidal plexus (Fig. 314), unite the *portal* and *systemic* venous systems (Fig. 314). When it is remembered hemorrhoidal veins have no valves and that they are frequently squeezed at the *buttonhole-like slits* (Fig. 300) through which they pass to the outer side of the rectum and by muscles surrounding the anal canal it is easy to understand how the erect posture assumed

by man, defecation, fecal impaction, cancer, stricture, foreign bodies, enlargement of the prostate, inflammatory diseases of the rectum characterized by pressure or dragging upon the rectal veins, persistent straining and congestion of vessels in the mucosa and underlying structures participate in enlargement of venous capillaries and formation of varicose hemorrhoids in the terminal rectum.

With this knowledge one understands the manner in which heart lesions, cirrhosis of the liver, misplaced organs, abdominal tumors, pregnancy, and labor tend to produce hemorrhoidal disease, since they lead to congestion or obstruction of the portal and hemorrhoidal veins and their tributaries.

Untreated chronic catarrhal or specific ulcerative *proctitis* (Fig. 315) frequently leads to the formation of venous internal hem-

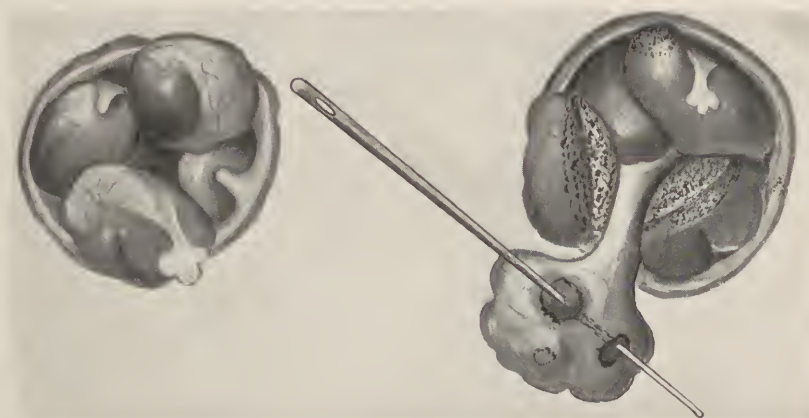


Fig. 315.—Chronic ulcerative coloproctitis complicated by internal hemorrhoids, hypertrophied papillae (right, left); large ulcerated polyp and excoriation of pile tumors.

orrhoids, since it keeps the mucosa inflamed, is accompanied by tenesmus, and results in the throwing out of exudates and formation of connective tissue which interfere with circulation of the venous radicals, causing them to become dilated or tortuous and form varicose hemorrhoidal tumors.

**Pathology.**—The appearance and structure of varicose—venous—internal hemorrhoids vary in a series of cases according to their cause, duration, and connection with external piles. They have their beginning in so-called blood *pools* located at the juncture of the venous and arterial capillaries (Fig. 300, insert).

These piles do not consist of individual dilated, but are composed of multiple enlarged, pouched, or tortuous venous radicals separated or bound together by a connective-tissue stroma, and

in such tumors radicals in and veins beneath the mucosa are involved (Fig. 314). In neglected cases the varicose process may extend in any direction to form venous hemorrhoids or continue upward until small and large veins of the lower rectum are involved and appear as thickened, bluish, worm-like swellings, or elongated, soft, movable masses situated in the mucous membrane and submucosa.

Vein walls, owing to pressure of the blood column, continued irritation or chronic proctitis, become thin or considerably thickened due to hyperplasia of the muscularis, increase in connective or proliferation of embryonic tissue with budding of the intima into the vessel lumen.

Neglected hemorrhoids increase in size through greater dilatation of old, or formation of new venous radicals, and the accumulation of connective tissue in vein walls, intervenous spaces between pile tumors, and in the muscular coat.

The size of hemorrhoids is due largely to contained blood and not newly formed tissue, for after death and when punctured they readily collapse and diminish in size, and when sectioned, varicose piles appear to be made up of congeries of minute venous (Fig. 311) and arterial capillaries surrounded and separated by connective tissue, the latter being abundant on their outer edge (Fig. 310, *B*).

Small cell infiltration is observed to a slight degree in vein walls and to a marked one in the perivascular tissue, and intravenous connective tissue often contains epithelial and glandular cells. The underlying mucosa may be thin or thickened, and smooth, granulated, or ulcerated. Occasionally signs of *phlebosclerosis* are observed, which is, in a measure, responsible for dilatation of the veins and terminal infection. In extreme cases vein walls are thickened, appear as a transparent fibrous covering, or melt into adjacent tissue, forming so-called *cavernous* piles. Exceptionally through the formation of fibrous deposits vessels disappear and venous hemorrhoids lose their spongy consistence, become indurated, and feel like fibromata. Usually varicose hemorrhoids contain arterial capillaries, but do not pulsate unless the tumor contains an arterial twig of fair size, under which circumstances they are sometimes diagnosed as arterial piles.

As a rule one or more varicose veins lie in spaces between hemorrhoids, but in aggravated cases veins of the mucous membrane and submucosa are involved and the lower rectum everywhere has a thickened, convoluted, purplish appearance (Fig. 314).

In the beginning hemorrhoidal tumors appear during straining as single or multiple, small, smooth and round varicose swellings





Fig. 316.—Large edematous external and protruding ulcerated and strangulated internal hemorrhoids that induced sphincteralgia and constipation.

that disappear within the rectum following defecation. Later, as a result of trauma incident to the passage of semisolid and hardened

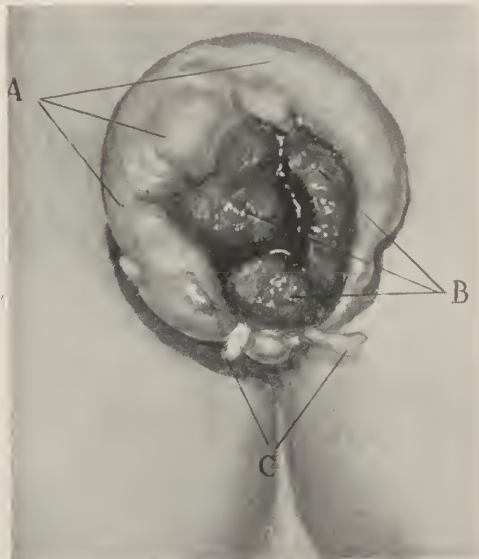


Fig. 317.—A, Inflamed and edematous external hemorrhoids; B, strangulated gangrenous internal piles; C, papillomata and enlarged anal papillæ.

feces and straining during defecation, hemorrhoidal tumors rapidly increase in size, assume a globulated or irregular shape, are creased

by fibrous tissue strands, granulated or ulcerated, protrude or bleed during defecation, and are difficult to return and retain above the sphincter (Fig. 317), which is relaxed from daily stretching induced by the extruding piles (Fig. 316).

Acutely inflamed, edematous (Fig. 316), and hemorrhoids strangulated (Fig. 317) by the sphincter rapidly enlarge to enormous size, are very sensitive and exhibit a constant tendency to extrude through or remain outside the anus (Fig. 316). Under such circumstances the author has observed a mass of piles as large as the fist that was black and fragile through gangrenous changes resulting from sphincteric strangulation (Fig. 317).

In deplorable cases one sometimes encounters thrombotic, cutaneous, capillary, and venous piles in the same case, or different types of hemorrhoids associated with polyps, enlarged anal papillæ (Fig. 317), cryptitis, procidentia recti, fistula, fissure in ano, cancer, or other anorectal affection.

## Chapter XXX

### Hemorrhoids (*Continued*)

#### INTERNAL VARICOSE—VENOUS—HEMORRHOIDS, EXTERNO-INTERNAL HEMORRHOIDS

**Symptoms.**—Internal varicose—venous—hemorrhoids may be present for years without producing symptoms and not be discovered until an examination is made for another affection.

Manifestations vary with size, number, location, and condition of the tumors, and when associated with another rectal disease symptoms of one may be confused with the other. Venous hemorrhoids do not bleed or protrude in their incipiency, but as they enlarge and are repeatedly caught and bruised by passage of the feces they gradually begin to protrude or bleed during stool, which directs the patient's attention to them.

The chief manifestations of varicose internal hemorrhoids are *protrusion* (see Plate VI), *hemorrhage*, and *pain*; and one or the other causes the patient to seek relief.

*Protrusion.*—Usually patients do not discover piles until they protrude at stool; in the beginning tumors are single, ovoid, and quickly recede following defecation, but as they increase in size and number and are daily pushed downward during evacuations they elongate, take on an irregular contour, extrude through the anus to a greater degree, and show but a slight tendency to withdraw above the sphincter. As hemorrhoids enlarge further defecatory trauma increases and they become swollen, indurated, edematous or gangrenous, and are very difficult to return and keep within the rectum (Fig. 317).

Distorted piles act as foreign bodies in the anal canal and incite tonic or clonic sphincteric spasms that continue until the attack subsides.

In obstinate cases when hemorrhoidal tumors constantly tease or stretch the anal muscle it relaxes from fatigue or is paralyzed from distention and the patient has a patulous anus. Under such circumstances and when piles are associated with some other disease accompanied by straining or frequent stools, internal venous piles remain outside the anus or immediately protrude when replaced. As a result of constant protrusion the sphincter may re-

main quiescent, be partially paralyzed, or become irritable and contract about piles, obstructing the return flow of venous blood, causing them to rapidly enlarge, which is followed by excruciating pain or extensive sloughing of hemorrhoidal tissue.

When the muscle relaxes inflammation quickly subsides and the patient is relieved, but where sphincteric strangulation continues hemorrhoids change from a purplish-red to a blackish color, are gangrenous (Fig. 317), and slough partially or completely off in rare instances, bringing about a *spontaneous* cure.

Large *interno-external*—combination—piles are located at the anal margin and surgeons, mistaking them for venous hemorrhoids, have pushed them into the rectum, which is a mistake, since they have a skin attachment and instantly make their reappearance. These tumors invariably incite more or less sphincteralgia and a hypersecretion of mucus which dribbles through the anus, excoriating the perianal skin and causing pruritus ani.

Hemorrhoids may protrude independently or be associated with cancer, polyps, or procidentia recti (Figs. 323, 324) that extrudes them through the anus.

*Hemorrhage* from typical varicose internal hemorrhoids is usually *venous*, but may be arterial or mixed, but bleeding from these piles comes from connecting capillaries and not arteries or veins. Blood may ooze, spurt, or escape in a steady stream through distinct ulcers or hemorrhoidal mucosa at several pinpoint lesions when excoriated. In the beginning blood is observed in streaks on the feces or smears on toilet paper; later it is more profuse and finally in aggravated cases hemorrhage becomes serious or alarming and blood is voided in drops or a stream during straining. Ordinarily from a teaspoonful to a tablespoonful is lost during an evacuation, but in deplorable cases the amount may vary from a few ounces to a pint; as a rule the patient overestimates the extent of the hemorrhage because blood is often mixed with water in the chamber or toilet.

The author has observed blood to escape from varicose hemorrhoids from an *artery* in *spurts* and has seen *venous* blood projected in *jets* from pressure during excessive straining, but generally the flow is in a steady stream or oozes continuously during defecation, dripping from extruded piles into the toilet. Generally bleeding continues until piles recede or have been replaced. When the sphincter is relaxed or paralyzed and hemorrhoids remain outside the anus they may bleed continuously or at short intervals. Hemorrhage is more profuse when stools are fluid or nodular than if semisolid.



PLATE VI



Strangulated internal hemorrhoids, some of which are undergoing gangrenous changes.



Slight hemorrhages extending over a short period do not affect the patient, but when they occur day after day for months or the sufferer loses several ounces of blood at once or in a short time definite manifestations—pallor, anemia, fainting spells, fast, weak pulse, loss of weight, nervousness, impaired digestion, general weakness, or rectophobia—are in evidence.

The author has observed what was thought to be *pernicious anemia* clear up following the radical cure of bleeding piles and has treated patients suffering from cirrhosis of the liver and plethoric individuals where the condition improved following rectal hemorrhages. Daily bleeding from piles is harmful because, in addition to provoking the above symptoms, it makes the patient nervous and despondent.

*Fresh* or *clotted* blood may be seen on or mixed in stools of persons suffering from piles, but under such circumstances a complicating affection involving the upper rectum, colon, small intestine or stomach is suspected, when clots or coffee-grounds stools are observed; on the other hand, bright red or fresh blood indicates disease in the lower rectum or at the anus, but in rare instances, when hemorrhoids are returned above the sphincter, blood remains in the rectum until clotted, making diagnosis confusing.

Ancient physicians believed periodic rectal hemorrhages were beneficial and if arrested the patient would develop pulmonary tuberculosis, dropsy, or skin lesions, but happily this theory has been exploded.

Sometimes it is difficult to differentiate hemorrhoidal from bleeding induced by other anorectal affections.

Usually bleeding recurs at short or longer intervals once it starts, but the author has observed hemorrhoids where bleeding stopped spontaneously when tumors became edematous or fibrous and firm, and it may be stated that proportionately as piles become pedunculated their tendency to bleed diminishes.

*Pain.*—Internal venous—varicose—hemorrhoids may exist for years, causing fulness, soreness, and heat without causing pain, but when large they induce sensations of discomfort in the rectum or sacral region. When tumors are multiple, large, ulcerated, low down, and protrude the patient complains of interrupted sharp lancinating or continuous agonizing heavy pain caused by sphincteric spasms which also prevent the sufferer from obtaining sleep or relief in any position until piles are released, slough off, or sphincteric irritability is allayed by medication or surgery. Strangulated piles are extremely sensitive to touch and are responsible for excruciating suffering

during and following defecation. Strangulation is more often observed in young or middle-aged individuals than old people because in the latter tumors are large, have protruded for years, and caused relaxation or paralysis of the anal muscle.

*Miscellaneous Symptoms.*—Proctitis is frequently associated with varicose hemorrhoids and may precede or be caused by them. Catarrhal inflammation in these cases may be induced by cathartics taken to procure soft movements, using anal dilators, employed to divulse the sphincter, proprietary or patent nostrums used to relieve pain, protrusion, or hemorrhage. Proctitis is characterized by seeping of mucus through the relaxed sphincter, which causes pruritus ani, excoriation of perianal skin, and staining of linen.

Hemorrhoidal patients frequently complain of blood or mucus in the stools, but when piles are extensively ulcerated, infected, or the seat of an abscess the discharge is mucopurulent, tinged with blood.

*Urethral, vesical, and prostatic* disturbances incident to irritability and spasms of the sphincter or levator ani muscle are occasional manifestations of aggravated varicose hemorrhoids, and *nervousness* due to fear—rectophobia—of bleeding or sphincteralgia is a frequent manifestation.

*Digestive disturbances* resulting from loss of blood or augmented peristalsis incited by an irritable rectum sometimes complicate hemorrhoidal disease.

*Reflex pains* in the sacrococcygeal and prostatic regions, back, legs, heel, or penis, are often complained of by individuals afflicted with ulcerated, protruding, or strangulated piles.

**Complications.**—Internal hemorrhoids are sometimes caused by or associated with *heart lesions, cirrhosis of the liver, enlarged ptotic organs*, and tumors causing *obstruction—congestion of the portal circulation, gangrene of pile tumors* with resulting *toxemia, locomotor ataxia, brain or cord lesions* controlling anorectal muscles, *secondary anemia*—with delirium, cardiac weakness, and invalidism, the result of repeated hemorrhages, *embolism* from thrombosed hemorrhoids, *hyperchloridia, chromatosis*, and *hemorrhagic proctitis*.

From what has been said concerning their symptoms and complications under varying circumstances one realizes venous—varicose—hemorrhoids may slightly disturb or make the patient miserable, cause him to become a chronic invalid, or, in rare instances, terminate fatally.

**Diagnosis.**—There is no difficulty in diagnosing varicose hemorrhoids when a careful history is taken, the anus and perianal skin have been inspected, and the rectum cautiously examined



with the gloveless finger and through the anoscope. Unfortunately many physicians and surgeons are careless in their diagnostic technic, frequently mistaking cancer, fissure in ano, polyps, and other anorectal affections for internal piles; very often making a diagnosis of hemorrhoids on finding blood on the shirt or patient's statement that he bleeds from the rectum or something extrudes through the anus.

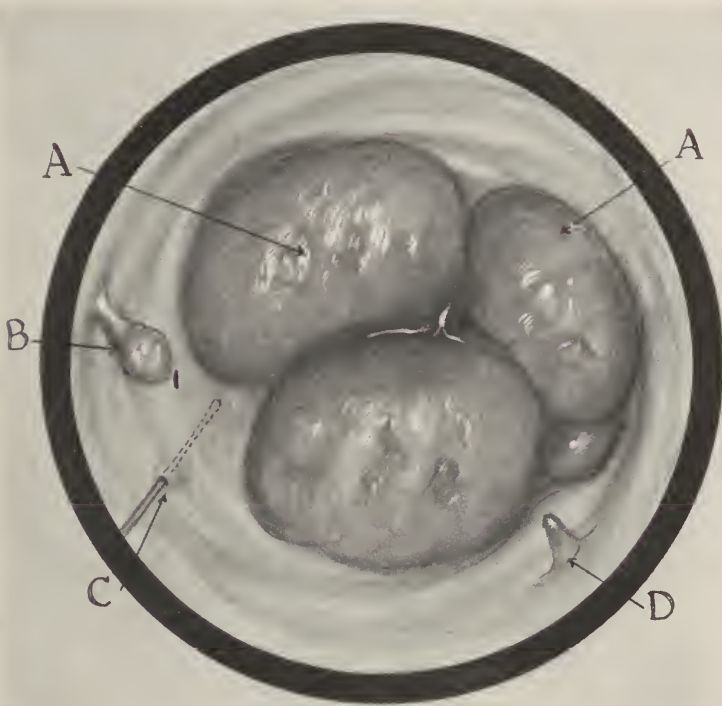


Fig. 318.—Anoscopic view of lower rectum showing *A*, large internal hemorrhoids; *B*, polyp; *C*, fistula, and *D*, enlarged anal papilla.

Venous hemorrhoids are pliable blood-filled pouches and may disappear upon pressure, which explains why they are not always felt with finger or seen through the proctoscope. Large indurated, thrombosed, and edematous hemorrhoids are easily detected with finger or observed through a sloping anoscope (Fig. 318) as withdrawn. Usually small, medium, or large internal venous piles are brought into view by *everting the anus* as the patient *strains giving him an enema*, drawing them out with a suction pump (Figs. 319, 320), introducing six rosin-covered tampons through a proctoscope and



Fig. 319.—First step in the withdrawal of hemorrhoids with suction cup.



Fig. 320.—Second step in withdrawal of hemorrhoids with suction cup.

*simultaneously withdrawing them (Fig. 335), extruding tumors with first and second fingers introduced into the vagina (Fig. 334), inserting a speculum which is made to catch and expose piles by tilting its lower end as withdrawn (Fig. 338), injecting them with water or an anesthetic which rolls them into view (Fig. 336), by anesthetizing and pulling them down through the window of a speculum with sponge forceps when high (Fig. 341), extruding them with the author's inflatable bag*



Fig. 321.—Method of extruding hemorrhoids with the author's inflatable bag.



Fig. 322.—Method of bringing internal hemorrhoids outside by making traction with fingers following introduction of a retractor.

(Fig. 321), and exposing them following the introduction of a retractor and pulling upon adjoining skin (Fig. 322).

Hemorrhoids ordinarily are satisfactorily exposed for examination or operation by having the patient take a small glycerin or soapsuds enema and strain until they have been extruded.

Having previously discussed the location, color, form, number, and characteristics of internal hemorrhoids and shown their general

appearance in accompanying drawings and photographs, it remains for the author here to enumerate different diseases for which varicose—venous—hemorrhoids have been mistaken, and briefly point out methods of differentiating them. Following are the affections and tumors that most closely simulate varicose hemorrhoids:

1. Thrombotic, cutaneous, capillary, and interno-external hemorrhoids.

2. Rectal polyps.
3. Procidentia recti.
4. Ulcerative colitis and proctitis.
5. Fissure in ano.
6. Hypertrophied prostate gland.
7. Hypertrophied anal papillæ.
8. Villous tumors.
9. Malignant growths.
10. Condylomata.
11. Pruritus ani.
12. Phleboliths.
13. Chromatosis.
14. Hemorrhagic proctitis.
15. Hemorrhage from other organs.

*Thrombotic hemorrhoids* are distinguished by their small size, firm feel, dark bluish color (Figs. 302, 303), sudden onset, location at the anal margin, and accompanying sphincteralgia.

*Cutaneous hemorrhoids* are recognized by their thick hypertrophied covering of the skin (Fig. 306).

*Capillary hemorrhoids* are diagnosed by their small size, raised, uneven punctate surface (Fig. 310, A), frequent slight bleeding, and resemblance to a strawberry.

*Interno-external hemorrhoids* (Fig. 306, C) are covered above by mucosa and below by integument and possess characteristics of both internal venous and external cutaneous piles.

*Rectal polyps, adenomas* (Fig. 323), which are club shaped and have a long, narrow, pedunculated whitish attachment (Fig. 323), are unlike venous internal hemorrhoids, which are purplish in color, globular in form, and possess a broad base.

*Procidentia recti* is more frequently mistaken for varicose hemorrhoids than other rectal affection, but the condition is more frequently encountered in infancy and childhood and the tumor mass is large, single, pyriform in shape, smooth, has a red velvety covering of mucosa, is attached around the circumference of the bowel, exhibits a slit-like center, and protrudes during defecation (Fig. 324) without inciting pain or sphincteralgia.



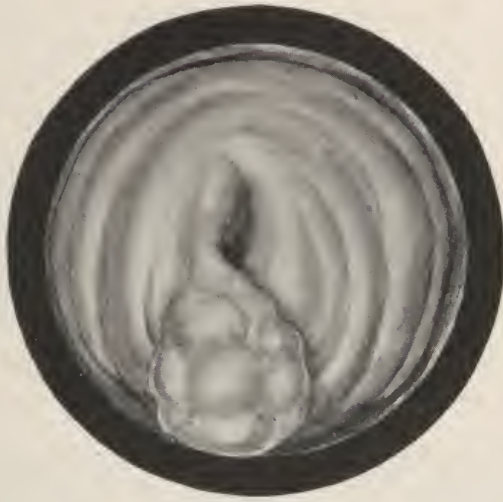


Fig. 323.—Proctoscopic view of procidentia sigmoidæ caused by large polyp—adenoma.

*Ulcerative colitis* and *proctitis* (Fig. 315) is often mistakenly operated for piles because of accompanying rectal hemorrhages,



Fig. 324.—Internal hemorrhoids complicated by procidentia recti and diminutive polyps.

which is inexcusable, since ulcers causing bleeding in no way resemble ulcerated hemorrhoids. In coloproctitis bleeding occurs

from well-defined lesions scattered over the mucosa, the patient suffers from diarrhea, and does not complain of protrusion.

*Fissure in ano* ought not to be taken for venous hemorrhoids owing to appearance of the slit-like rent located in the posterior anal commissure (Fig. 190), which bleeds slightly and is complicated by agonizing sphincteralgia following defecation.

*Hypertrophy of the prostate gland* has been confused with internal piles, but the author is unable to understand why, because in prostatic enlargement there is no bleeding, protrusion or sphincteralgia, and the tumor is large, firm, situated high, and causes urinary complications.

*Hypertrophied anal papillæ* (Fig. 318) at Hilton's white line are small, cone shaped, have a whitish bloodless apex, and when en-



Fig. 325.—Angioma villous tumor of the anus (Adler).

larged sometimes resemble skin-tags, but are totally unlike varicose hemorrhoids, which are purplish and show a tendency to protrude, but seldom cause pain or sphincteralgia.

*Villous tumors* (Fig. 325) are rare and distinguished by their broad base, slow growth, dark red color, spongy feel, projecting villi, and frequent profuse hemorrhages. When small they resemble fragile polyps, show a tendency to protrude, but seldom cause pain or sphincteralgia.

*Malignant tumors* are differentiated from internal piles by their massive size, nodular contour, broad base and crater-like ulcers (Fig. 590), characteristic odor, acrid discharge, obstructing tendency, cachectic appearance of the patient, and rapid loss of weight accompanying malignancy. They do not protrude or in any way resemble piles except they sometimes bleed.

*Condylomata*—*vegetating warts*—appear *singly*, in *groups*, or *en masse* upon the perianal skin (Fig. 484), are accompanied by an acrid rectal or vaginal discharge, and bleed when broken off, otherwise there is no excuse for confusing them with venous hemorrhoids.

*Pruritus ani*, so-called *itching piles*, is characterized by itching about the anus, usually the result of proctitis and discharge of irritating mucus. *Pruritus ani* is not accompanied by pain, protrusion, bleeding, or other manifestations of internal piles, but hypertrophied radiating folds of skin have been mistaken for cutaneous piles.

*Phleboliths*, rare in hemorrhoidal veins, have been confused with venous piles. These firm enlargements are encountered in varicose veins of aged persons and their composition is not understood further than it is known they contain animal matter, lime, oxid of iron, and potassium. Phleboliths are usually single, from wheat grain to pea size, egg shaped, fragile and brownish in color, from which it is seen they in no way resemble hemorrhoids.

*Chromatosis* is characterized by a liver-colored thickened rectal mucosa that granulates and bleeds, but the disease never assumes a tumor formation, protrudes, or incites sphincteralgia.

*Hemorrhagic proctitis* is seldom encountered, but has been mistaken for venous piles on account of profuse bleeding that occurs from raised, spongy, granulated, small or large denuded areas located at one or more points in the rectal mucosa (Fig. 760).

*Hemorrhages incident* to injuries, foreign bodies, fecal impaction, helminths, and any condition or disease where blood is evacuated through the anus, are liable to be diagnosed as internal venous piles, but a careful digital and proctoscopic examination of the rectum with an analysis of feces promptly reveals the cause of bleeding.

*Hemorrhoids*, *procidentia recti*, and *polyps* usually protrude and may bleed, which accounts for the frequency with which they have been mistaken for each other.

That the reader may form an idea concerning the characteristics of these tumors the author has arranged the table shown on page 468, which briefly summarizes the differentiating points between these affections.

AUTHOR'S DIFFERENTIAL DIAGNOSIS BETWEEN HEMORRHOIDS, PROCI-  
DENTIA RECTI, AND POLYPS

No.	Characteristics.	Hemorrhoids.	Procidencia recti.	Polyps.
1	<i>Occurrence.</i>	Middle life.	Any age; most frequently in children.	All ages.
2	<i>Size.</i>	Small.	Very large.	Large or small.
3	<i>Shape.</i>	Ovoid.	Pyriform.	Bell-clapper.
4	<i>Number.</i>	Multiple.	Single.	Usually single.
5	<i>Color.</i>	Purple.	Red, velvety like.	Color of the mucous membrane.
6	<i>Hemorrhage.</i>	Usually profuse.	None except when ulcerated.	Rare.
7	<i>Discharge.</i>	None.	Considerable; mucus.	Slight; mucus.
8	<i>Openings.</i>	None.	Slit-like in center.	None.
9	<i>Attachments.</i>	Segmental.	Includes entire circumference of the bowel.	Pedunculated.
10	<i>Protrude.</i>	May or may not.	Always during defecation.	Rarely.
11	<i>Returns spontaneously.</i>	Frequently.	Rarely.	Usually except when strangulated.
12	<i>Revealed by</i>	External or internal examination.	External examination.	Internal.
13	<i>Pain.</i>	Extremely painful when ulcerated or strangulated.	No pain; sensation of weight, fulness, and dragging down.	Slight pain; sensation of foreign body in rectum.
14	<i>Feces discharged</i>	Between the tumors.	Through central slit.	Beside the tumor.
15	<i>Tendency to recur after operation.</i>	Never recur.	Occasionally.	More frequently.

**Prognosis.**—The prognosis is universally good in properly treated, but in deplorably neglected cases of varicose internal hemorrhoids patients are miserable, emaciated, anemic, weak from loss of blood, and occasionally cachectic when piles are extensively ulcerated and infected. Deaths have been reported from *secondary anemia, portal pyemia, edema of the lung*, and *general sepsis* arising from internal hemorrhoids, and patients have occasionally died from bleeding following hemorrhoidal operations.

The author has never lost a patient from hemorrhoids or an operation performed to cure them, but has treated two individuals who died—one from edema of the lung and the other from sepsis resulting from sloughing and infection caused by the injection of carbolic acid into hemorrhoids by itinerant pile doctors. Two other patients were lost, one during non-operative treatment and the other following the ligature operation for piles; death in both being caused by diabetes.

Following operations for hemorrhoids patients ask if the cure



will be permanent, and the author answers in the affirmative, but adds that in rare instances piles recur years later in patients who have or subsequently develop heart lesions, cirrhosis of the liver, or obstructing anorectal lesions that partially or completely occlude portal and hemorrhoidal veins.

In conclusion the author would emphasize the fact that the prognosis is more favorable following hemorrhoidal than after operations performed for other anorectal affections, and that he has never lost a patient from hemorrhage following thousands of operations performed by different methods for the relief of all kinds of hemorrhoidal tumors; subsequent to *local anesthesia hemorrhoidectomies* serious hemorrhages are less rarely encountered than after ether operations, which are often followed by straining, vomiting, or withdrawal of dressings by the semiconscious patient.

## Chapter XXXI

### Hemorrhoids (*Continued*)

#### INTERNAL VARICOSE—VENOUS—HEMORRHOIDS, EXTERNO-INTERNAL HEMORRHOIDS

**Preventive and Palliative Treatment.**—Owing to their varied causes, character, manifestations, and complications considerable ingenuity must be exercised in the treatment of hemorrhoids if universally successful results are to be obtained.

In a series of cases the treatment is *preventive*, *palliative*, or *surgical*.

**Preventive.**—Constipation, congenital defects of rectum, catarrh of the intestine, and diseases responsible for delayed evacuations, diarrhea, or straining during stool are predisposing factors in hemorrhoids and must be eliminated or piles may recur.

Individuals who gourmandize, drink abundantly of alcoholics, eat highly seasoned food, indulge in excessive venery, have irregular habits, are lazy, sit a long time in the toilet, or purge themselves daily must reform their plan of living and exercise in the fresh air to avoid congestion and enlargement of hemorrhoidal veins. The employment of dirty, harsh, and printed paper for toilet purposes should also be avoided.

In the prophylactic treatment of hemorrhoids it is essential that the patient be treated for heart lesions and cirrhosis of the liver causing congestion of the portal vein and its tributaries, and adopt measures that will procure regular daily soft evacuations.

By following the above plan hemorrhoids may be forestalled and incipient piles prevented from increasing in size, bleeding, or protruding.

**Palliative Treatment.**—A spontaneous cure of hemorrhoids is rarely observed, but has occurred, the result of *strangulation* and *sloughing*, *ulcerative* and *inflammatory lesions* that destroyed tumors or caused obliteration of varicose veins through accompanying inflammatory deposits or formation of scar tissue that contracted about vessels. In several instances the author has observed a cure follow where piles were caught in the grasp of the sphincter, became gangrenous, and sloughed off piece-meal or *en masse*.

Occasionally hemorrhoids are apparently cured without surgical intervention where bleeding, pain, or protrusion is detected early,

but, as a rule, the beneficent action of palliative measures is only temporary and other attacks occur sooner or later, when the patient thought his piles had been permanently cured.

One is justified in resorting to palliative treatment where the patient is greatly debilitated, dying from another disease, cannot afford the time or expense of radical treatment, is being prepared for operation, or declines surgical intervention. When the author takes a case the patient is asked if he is seeking *temporary relief* or a *permanent cure*; if he chooses the *former*, palliative measures are instituted, and when he elects the latter, his piles are promptly operated on, but in either case he is informed as to the probable result.

Until recently hemorrhoidal operations were dreaded, and with reason, because they were bunglingly performed under ether, required considerable time, were frequently accompanied or followed by alarming hemorrhage, postoperative pain was agonizing, retention of urine frequent, healing of wounds slow, and because they necessitated the patient remaining in the hospital for two or three weeks under the care of special nurses, which made the procedure expensive.

As a result well-to-do patients suffering from hemorrhoids usually sought treatment by palliative measures or the *injection method*, practised by some regular physicians and many ignorant *quacks*, who advertised to cure piles without using *knife, ligature* or *cautery*, or delaying the patient from business.

Hemorrhoidal operations no longer require a general anesthetic or necessitate the patient's remaining in bed for more than from one to three days, or not at all, and postoperative treatment causes little suffering, hence it is a mistake for patients to choose palliative in preference to the radical treatment of piles. Frequently it takes longer to relieve an *acute attack* by palliative measures than to permanently cure hemorrhoids by operation, and treatments for the *former* are more painful than the latter.

Patients about to undergo treatment for hemorrhoids are carefully examined to ascertain if they suffer from constitutional or local disease that would interfere with the treatment.

*Regulation of stools* is important, and means are taken to procure daily *semisolid* evacuations, because both *fluid* and *hard nodular* feces aggravate the patient's condition. Satisfactory movements are procured by supervising the diet, having the patient eat fruit, and if necessary take a nightly dose of olive or mineral oil, ℥iss (45.0 cc.); magnesium citrate, ℥ij (8.0 cc.); apenta, carabana, or hunyadi water, ℥iv (120.0 c.c); sulphur, 10 to 20 gr.

(0.60–1.3 gm.); regulin,  $\mathfrak{z}\text{j}$  to  $\mathfrak{z}\text{ss}$  (4–15 gm.); fluidextract of cascara sagrada,  $\mathfrak{m}\mathfrak{z}\mathfrak{o}$  (1.3 c.c.); confection of senna,  $\mathfrak{z}\text{i}$  to  $\text{ij}$  (4.0–8.0 gm.), or other mild laxative that will bring about the desired result.

The following dinner pills have proved satisfactory in the author's cases:

R̄.	Resinæ podophylli.....	gr. ij	0 12;
	Quininæ sulphas.....	gr. viij	0 53;
	Fel bovis purif.....	gr. xvj	1 06.
Misce et fiat massa div. in pilulæ xvj.			
Sig.—One or two pills at night.			

R̄.	Ext. rhamni purshianæ.....	$\mathfrak{z}\text{ss}$	2  0;
	Ext. nucis vomicæ.....	gr. vj	0  4;
	Ext. phyostigmatis.....	gr. iij	0  2;
	Ext. belladonnæ.....	gr. ij	0 12.
Misce et fiat massa div. in pilulæ xx.			
Sig.—One pill at night.			

When the patient suffers from constipation and acutely *inflamed hemorrhoids*, the following prescription can be relied upon to procure suitable painless evacuations.

R̄.	Magnesii carbonas.....	$\mathfrak{z}\text{ss}$	15 0;
	Potassii bicarbonas }.....	$\mathfrak{z}\text{ij}$	8 0;
	Syrupus sennæ		
	Aqua destillata.....	q.s. ad. $\mathfrak{z}\text{ij}$	60 0.—M.
Sig.—Take before breakfast.			

Daily evacuations are desirable, but purging as practised by many physicians is harmful, and *colocynth* and *aloës* are particularly undesirable, since they *irritate* the rectal mucosa and *incite tenesmus*, which augments suffering. When fecal matter repeatedly collects in the lower rectum and causes straining or traumatizes hemorrhoids, *enemata* of cold or warm water, soapsuds, or oil are preferable to laxatives, since they procure quicker and less painful evacuations.

Individuals suffering from hemorrhoids seek relief from *pain*, *bleeding*, *protrusion*, or *strangulation*, and palliative measures temporarily alleviate these symptoms when employed early after the manner recommended below.

*Measures for Mitigating and Arresting Pain.*—Suffering incidental to hemorrhoids results chiefly from inflammation, ulceration, protrusion or strangulation of pile tumors, and incidental sphincter-algia and tenesmus.

When sphincter-algia is distressing pain is diminished or arrested by having the sufferer eat lightly, obtain soft movements, rest in the recumbent posture, and apply hot fomentations to the anus until the sphincter muscle relaxes.

Congestion of hemorrhoids is lessened with the ice-bag, but



*hot* are preferable to *cold* douches (Fig. 326) and applications, because the *former* soothes and the *latter* causes the sphincter to contract, which prevents the return flow of blood.

Pain generally subsides as irritability of the anal muscle is allayed through the employment of heat applied over the anus in a poultice or hot-water bag and a lotion composed of fluidextract of hydrastis—colorless— $\bar{5}j$  to  $\bar{5}iv$  (4.0–15.0), or an emulsion of



Fig. 326.—Author's ascending anal douche, useful in the treatment of inflamed or strangulated hemorrhoids.

olive oil,  $\bar{3}ij$  (90.0), containing bismuth subnitrate,  $\bar{3}ss$  (2.0), injected into the rectum once or twice daily.

Occasionally relief is derived from painting piles with a 10 per cent. eucain or cocain solution, or dusting them with analgin, anesthetin, or orthoform, but pain is arrested more quickly with a hypodermic injection of morphin, gr.  $\frac{1}{4}$  (0.016), or ointments or suppositories containing morphin or cocain in combination with belladonna, gr.  $\frac{1}{4}$  (0.016).

The author has never failed to mitigate or arrest pain and sphincteralgia quickly with one or other of the accompanying prescriptions, when employed following an evacuation and bathing the parts with hot water or astringent solution:

R̄.	Cocainæ hydrochloridum.....	gr. x	0 6;
	Morphinæ sulphas.....	gr. viij	0 53;
	Ext. belladonnæ.....	ʒj	0 6;
	Hydrargyri chloridum mite.....	gr. x	0 6;
	Adeps. lanæ hydrosus.....	ʒj	30 0.

Misce et fiat unguentum.

Sig.—Apply to rectum and piles three times daily with the finger or pile-pipe.

R̄.	Bismuthi subnitrates.....	ʒij	8 0;
	Morphinæ sulphas.....	gr. viij	0 53;
	Glycerinum.....	ʒij	8 0;
	Ungt. belladonnæ.....	ʒj	4 0.

Misce et fiat unguentum.

Sig.—Apply as required through a pile-pipe or collapsible ointment tube.

R̄.	Morphinæ sulphas.....	gr. j	0 06;
	Ext. belladonnæ.....	gr. ij	0 12.
	Oleum theobromatis.....	q.s.	

Misce et fiat suppositoriæ No. viij.

Sig.—Insert one as occasion demands to relieve pain, tenseness, or sphincteralgia.

Patients prefer ointments to suppositories because they are conveniently applied through a pile-pipe or collapsible ointment tube and because the latter are often soft and crush or induce pain when they are inserted.

When it is desirable to minimize suffering, diminish swelling, or cause hemorrhoids to shrink up, the following combination of drugs will accomplish desired results:

R̄.	Ichthyol.....	gr. xxxij	2 12;
	Cocainæ hydrochloridum.....	gr. ij	0 12;
	Ext. belladonnæ	}	gr. iiij 0 2.
	Ext. hamamelis		
	Ext. stramonii		
	Oleum theobromatis.....	q.s.	

Misce et fiat suppositoriæ No. viij.

Sig.—Introduce one every four hours until patient is relieved, and thereafter as indicated.

During an acute attack of hemorrhoids accompanied by protrusion, pain, or bleeding patients are made comfortable and recurrence is sometimes forestalled by applying the accompanying ointment to pile tumors and rectal mucosa as often and long as required:

R̄.	Ext. opii.....	gr. x	0 6;
	Balsamum peruvianum.....	ʒij	8 0;
	Sol. adrenalin chloridi.....	ʒss	2 0;
	Adeps. lanæ hydrosus.....	ʒj	30 0.

Misce et fiat unguentum.

Sig.—Apply three times daily through an ointment applicator.

*Technic of Returning Prolapsed Internal Hemorrhoids.*—Protruding piles frequently return above the sphincter *spontaneously* or when the patient lies on his back and then draws upward as he separates anal margins with the fingers.

Extruded hemorrhoids caught in grasp of the sphincter rapidly enlarge through congestion, since the return flow of venous blood is obstructed, hence they are replaced above the muscle at the first opportunity.

Reasonably large varicose piles are quickly returned with little difficulty or pain to the patient through bathing the parts with a hot boric solution, painting tumors with eucain—10 per cent. solution—anointing hemorrhoids with vaselin or oil, and working them gradually into the bowel one by one with the fingers. The process is less objectionable when piles are covered with a greased soft linen handkerchief before taxis is attempted.

It is useless to try and reduce large edematous hemorrhoids (Fig. 316) until after part of the serum has been squeezed out with fingers gripped about the mass or following eucainization and bistoury punctures. No attempt is made to return and keep large congested *interno-external* piles above the sphincter, for they will extrude again almost immediately. In rare instances where tumors were multiple, large and edematous, or strangulated, and could not otherwise be replaced, the sphincter has been divulsed or divided under local anesthesia, after which they were easily returned to the anal canal. Strangulated gangrenous piles (Fig. 317) require immediate removal, because if pushed above the sphincter they again protrude or slough and leave painful ragged ulcers in the mucosa.

In several instances the author observed a permanent cure following the dropping off of strangulated necrotic hemorrhoids. When piles are irreducible and the patient declines operative interference pain and sphincter algia are controlled as indicated above, and measures are employed that will shrink tumors and allay sphincteric irritability so the hemorrhoids may painlessly be returned in a short time.

Frequently the patient's consent to operation can be obtained after it has been explained that it is more painful and takes longer to relieve an acute attack by palliative measures than to operate and permanently cure his hemorrhoids.

Congested, extruded internal hemorrhoids are most quickly reduced in size by continuous applications of cold water, the ice-bag, astringent solutions—infusion of oak bark, ichthyol, 25 per cent., silver nitrate, 2 per cent., fluidextract of hydrastis or witch hazel,

alum, ʒj (4.0), ergot, adrenalin (1 : 1000), boroglycerid, 25 per cent., or a lead-and-opium wash:

R̄.	Liquor plumbi subacetatis.....	ʒiv	15 0;
	Tincturæ opii.....	ʒiiss	10 0;
	Aqua destillata..... q.s. ad.	ʒiv	120 0.—M.

Sig.—Apply constantly hot or cold until the tumors shrink up.

Suppositories containing ichthyol and gallic acid in combination with other drugs as given in the accompanying prescription are also useful for the same purpose:

R̄.	Ichthyol	}.....āā	gr. xxiv	1 6;		
	Acidum gallicum					
	Bismuthi subnitras.....				gr. xxxij	2 12;
	Oleum theobromatis.....					
Misce et fiat suppositoriæ No. vj.						
Sig.—Insert one three times a day.						

Misce et fiat suppositoriæ No. vj.

Sig.—Insert one three times a day.

When these agents fail to shrink tumors so they can be replaced, sphincteric irritability is responsible, and the muscle must be quieted by measures above recommended, otherwise hemorrhoids remain outside the anus indefinitely, causing continuous annoyance, or slough off as a result of prolonged strangulation; division or division of the anal muscle under local anesthesia is occasionally required to relieve this condition.

During acute attacks and at other times when piles persist in extruding after having repeatedly been returned, they are kept in place with a truss or pad of gauze placed over the anus which is supported by a T-binder or held in place with adhesive strips.

*Procedures for Preventing and Controlling Hemorrhage.*—The majority of hemorrhoids bleed at intervals or regularly irrespective of whether they protrude or not, and the amount of blood lost varies from a drop to several ounces. Bleeding is brought on or aggravated by straining, and constipation is relieved and soft stools procured after the above plan.

Erosions and ulcers in the mucosa responsible for bleeding are healed temporarily or permanently by daily cold injections of argyrol, ichthyol, or balsam of Peru (3 per cent.), application of Monsel's solution, tannic or gallic acid, adrenalin, hot-water compresses, styptic cotton or cauterization, and when feasible following the return of hemorrhoids above the sphincter. Astringent, styptic, and healing agents are more effective when kept in contact with the rectal mucosa by means of a pledget of gauze soaked in the solution and introduced through a small proctoscope.

Alarming hemorrhage from non-protruding and piles that have been replaced is controlled by plugging the anal canal with gauze after one of the plans shown in Chapter XXXVI.



When the above methods fail to stop persistent bleeding from extruded piles in or outside the anus, hemorrhage is controlled by a tightly adjusted external compress, whip-stitching the ulcer, or ligating or clamping the pile.

Subsequent to control of slight, profuse, or dangerous hemorrhage lotions, ointments, or suppositories containing adrenalin, tannic acid, iron, chrysarobin, etc., are effective when applied to the rectal mucosa daily for several weeks.

Years ago *leeches* were applied to hemorrhoids or anal region with the object of reducing the volume of blood and shrinking up hemorrhoids; but the practice has been abandoned because it is loathsome to the patient and the blood removed in this manner affords only temporary relief. *Non-protruding* causing pain or bleeding require practically the same treatment as extruding piles.

Hemorrhoidal disease is chronic and *habit-forming* drugs are prescribed cautiously or not at all, otherwise the patient becomes addicted to them.

Proctologists seldom administer iron, ergot, and other astringents or styptic remedies internally because they do little good and bleeding is more effectively controlled by local measures.

When perianal skin is excoriated from discharges of mucus or pus applications of silver nitrate (6 per cent.) heal erosions and recurrence is prevented by having the patient wear cotton over the anus, dust the parts with the accompanying powder, or protect the skin and mucosa with a healing ointment similar to that given below:

## DUSTING-POWDER

R.	Acidum boricum	}	.....āā	3ij	8 0;
	Zinci stearas				
	Talcum purificatum				
	Misce et fiat dusting-powder.			3j	4 0.
Sig.—Use as often as required.					

## HEALING OINTMENT

R.	Ungt. picis liquidæ	3j	4 0;
	Zinci oxidum	3ij	8 0;
	Ichthyol	3j	4 0;
	Ungt. aquæ rosæ	3j	30 0.
Misce et fiat unguentum.			

Sig.—Apply to perianal skin three times daily following cleansing with hot water or boric acid.

Frequency of acute hemorrhoidal attacks is diminished by daily cold irrigations or enemata of hydrastis fluidextract, 5j to 3iv (4–120), boric acid, ichthyol, potassium permanganate, or with the following combination:

R.	Fl. ext. krameria	3j	4 0;
	Sodii biborat.	gr. iv	0 24;
	Aqua destillata	3iv	120 0.—M.
Sig.—Inject after stool.			

**Amulets** were frequently employed by the ancients in treatment of piles, and some persons still believe charms or amulets cure or ward off certain diseases; evidence of which is found in the fact that some individuals carry a buckeye—horse chestnut—in the left pocket to protect them against “piles” or a *dried-up* potato to prevent them having “rheumatiz.”

Rare stones, “Hieracites”—Indian Stone—and “Hæmatites”—blood stone, etc.—are said to have warded off or cured hemorrhoids when suspended around the neck, and Bodenhamer suggests wearing the precious stone “Chrysolite” in a ring upon the middle finger of the left hand, since it is the *patron of wisdom and enemy of folly*.

**Other Non-operative and Surgical Palliative Procedures.**—The author has occasionally succeeded in arresting bleeding, stopping protrusion, or controlling pain with procedures enumerated below, but has seldom effected a cure with them, hence they have been discussed in the palliative treatment of piles:

1. Application of chemical caustics.
2. Cauterization: (a) acupuncture; (b) linear.
3. Electrolysis.
4. Écrasement.
5. Divulsion of the sphincter.
6. Crushing.
7. Torsion.
8. Submucous ligation.
9. Injection treatment.

*Application of Chemical Caustics.*—These agents are occasionally useful in *capillary*, but contraindicated in the treatment of varicose internal hemorrhoids. Nitric and carbolic acids, caustic potash, pyrogallic and butter of antimony have been used, but of such agents fuming nitric acid gives best results.

Nitric acid applications sometimes arrest bleeding or cure capillary—strawberry—piles by causing inflammatory deposits that block vessels or causing an ulceration that destroys tumors. Chemical caustics are objectionable since they are difficult to apply without injuring neighboring healthy structures, or penetrate too deeply, leaving painful ulcers that heal slowly.

Following anesthetization of mucosa hemorrhoidal ulcers are exposed through the window of a slide speculum, wiped dry, and treated with acid carried to it on a cotton-covered probe, after which the pile is cleansed with bicarbonate of soda solution to neutralize the agent and the speculum is removed. Injury to adjacent tissue is minimized by covering mucosa with vaselin and making treatments not oftener than once a week. Caustic paste

is unsafe because it is very destructive and often followed by alarming hemorrhages.

*Cauterization.*—A cure is sometimes accomplished by deeply *puncturing* piles once or several times with an electric or Paquelin cautery point, and when successful, burning destroys varicose veins or sets up an inflammation that, after occluding vessels, cause shrinkage of the hemorrhoidal tumors.

*Acupuncture* is undesirable because it is extremely painful, often accompanied by alarming hemorrhage, and seldom effects a permanent cure; treatments are made while piles are extruded or through an anoscope or slide speculum when located above the sphincter.

Some surgeons attempt to cure hemorrhoids by *linear cauterization* or *fulguration*, procedures having no advantages over acupuncture.

Cauterized hemorrhoids are swollen and sensitive for several days, and a sedative ointment is required to minimize pain and sphincteric spasms.

Large hypertrophied varicose piles are not suitable for cauterization with chemicals or actual cautery, and the treatment which is irrational is restricted to capillary and diminutive soft, copiously bleeding, small venous hemorrhoids.

*Electrolysis.*—Itinerant pile doctors and electrotherapeutists claim cures from electricity. Electric treatments have proved unsatisfactory and been discarded by the author because they make the patient nervous, cause severe pain, and accomplish little or nothing toward a permanent cure.

Improvement sometimes follows *electrolysis* when a needle connected with the negative electrode is inserted into the pile and the circuit is completed by applying the positive pole to the back or buttocks, the current being left on several minutes until the pile is charred or turns white. Unless pain, sphincteralgia, or swelling contraindicate, treatments are made to hemorrhoids until bleeding and protrusion have been arrested and tumor masses shrink up. A soothing ointment applied to the rectal mucosa and perianal skin following withdrawal of the needle adds greatly to the patient's comfort.

The plan of obliterating piles by surrounding and burning them with a hot galvanocautery wire—*snare*—is exceedingly painful and less effective than the procedure just described.

*Écrasement.*—Formerly hemorrhoids were destroyed with an *écraseur*, but the procedure has been discarded, as it is brutal and unreliable.

*Division of the Sphincter.*—Cures of hemorrhoids by *gradual* or *forcible* sphincteric divulsion have been reported, but the author's experience with the procedure indicates that results obtained in this way are not permanent. Dilation of the anal muscle is contra-indicated when hemorrhoids are multiple, large, indurated, or edematous, because the relaxed sphincter offers no opposition to their descent and they occasionally extrude or remain constantly outside the anus. In aggravated cases complicated by sphincteric irritability—squeezing piles—pain and bleeding is mitigated or

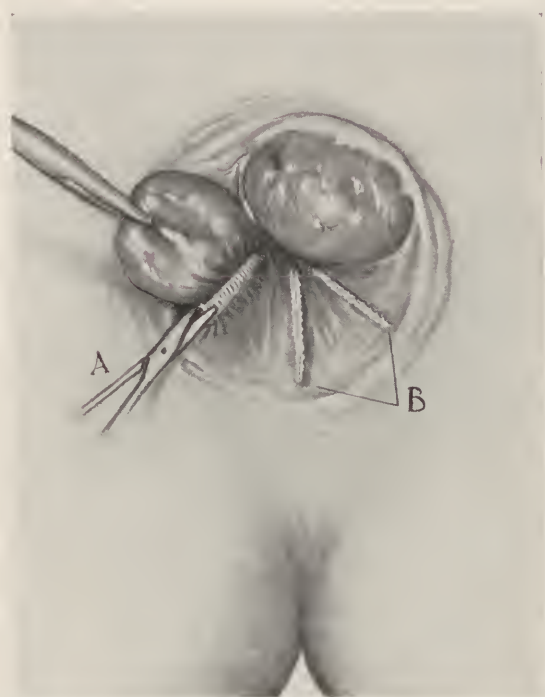


Fig. 327.—Crushing operation for hemorrhoids: *A*, Hemorrhoid crushed and being excised; *B*, appearance of crushed stumps following removal of tumors.

arrested by divulsing the muscle, but this treatment is not curative.

Apparent cures of capillary and small venous hemorrhoids occasionally follow stretching the sphincter, and in such cases benefit derived from the operation is due more to trauma and setting up of an inflammatory process in the piles than to causing relaxation of the anal muscle.

Divulsion of the sphincter is accomplished with fingers, thumbs, dilators, or speculum following infiltration of the lower



rectum with eucain or novocain. The anal canal is stretched first in one and then in the other direction until the sphincter and levator ani muscles are relaxed and the first and second fingers can be inserted into the bowel without pain or difficulty.

Frequently following divulsion internal piles protrude and bleed worse than before the operation.

*Crushing.*—Some surgeons attempt to cure hemorrhoids by crushing them with a “pile crusher” or angiotribe (Fig. 327), but the practice should be abandoned because it is cumbersome, leaves bruised tissue to slough off, results are uncertain, alarming hemorrhage has followed excision of crushed relegated tissue, and because hemorrhoids are easily cured in a shorter time by less objectionable methods. When this procedure is employed the author crushes tumors with his pile-clamp (Figs. 349, 350), which is efficient and convenient.

*Torsion.*—Manley advocated separately twisting piles to a pulp with fingers, but the plan is objectionable, since it inflames tumors, aggravates the patient’s condition, and is not curative.

*Submucous Ligation.*—Rickett’s operation consists in ligating veins feeding piles with a silk ligature introduced with a semi-circular needle; subsequently from lack of nourishment hemorrhoids are expected to atrophy. In the author’s hands the procedure proved unsatisfactory in a series of instances, because it was difficult or was followed by severe pain, concealed hemorrhage, vesical disturbances or infection, and it did not in a single instance cure the patient.

## Chapter XXXII

### Hemorrhoids (*Continued*)

#### INTERNAL VARICOSE—VENOUS—HEMORRHOIDS, EXTERNO-INTERNAL HEMORRHOIDS

##### INJECTION TREATMENT

**Carbolic Acid, Quinin and Urea.**—This method of treating piles was originated by Mitchell (1871), who sold the secret to any one wishing to become a “pile doctor.” The method has fallen into disrepute largely through its being practised chiefly by non-medical men and ignorant physicians who did a great deal of harm and made few cures with it. Cures are sometimes accomplished when injections are made by physicians having perfected their



Fig. 328.—Sloughing out of the rectum, perianal skin, and rectovesical septum that followed one carbolic acid injection treatment of a small internal hemorrhoid made by an advertising pile doctor.

technic, but when piles are indiscriminately injected with carbolic acid by doctors or laymen unfamiliar with the procedure all sorts of complications arise (Fig. 328), and the patient is left in a worse condition than before treatment.

The injection treatment appeals to the “well-to-do class,” because if successful it supposedly avoids an operation, quickly arrests bleeding and stops protrusion without severe pain, and

does not keep them from business. Occasionally piles are permanently cured, but usually the patient again seeks treatment for hemorrhoids within from one to three years.

In favorable cases injection of hemorrhoids is followed by discomfort and fulness in the lower rectum, but when the solution is incorrectly made or improperly injected, piles prolapse and become strangulated, infection occurs or they undergo sloughing when suffering is intense, and the patient complains constantly of tenesmus, sharp sphincteric contractions, excruciating continuous pains, enormous swelling of tumors which are very sensitive, and a chill, high temperature, and continuous throbbing in the lower rectum when infection takes place. When injections go *wrong* the patients suffer a great deal more and are confined to bed for a longer time than if they had undergone a radical operation for piles.



Fig. 329.—Probe in large rectovesical fistula (same case as shown in Fig. 328).

Carbolic acid is the basis of the solution, and when used strong (30–50 per cent.) destroys hemorrhoids by causing them to partially or completely slough off, but when employed weak (5 to 20 per cent.) injections set up an inflammatory process followed first by *vein blocking* and then by *shrinking* and *atrophy* of the tumors. Sloughing with the formation of ugly ulcers, abscess, or submucous fistula has often been observed by the author following the infiltration of piles with weak and strong carbolic acid solutions carefully prepared.

The injection treatment is best suited for *moderate sized bleeding* and *protruding* varicose and capillary internal piles, and should never be employed when hemorrhoids are *large* and *hypertrophied*, *acutely inflamed*, *strangulated*, *extensively ulcerated* or *continuously extrude*, when the *sphincter muscle* is *irritable* or the patient suffers from *complicating* rectal disease.

Under no circumstances should *external* or *skin* covered tumors be injected with carbolic acid, for the solution causes subcutaneous gangrene which ends in extensive ulceration, abscess, fistula, toxemia, infection or lung involvement, complications that often arise when combination or *externo-internal* piles are similarly treated.

The author treated 2 men who died from secondary infection of the lung following the injection of carbolic acid into external hemorrhoids by ignorant physicians, and another from exhaustion following sloughing out of the rectum and rectovesical septum (Fig. 329).

When piles are promiscuously distended with carbolic acid solutions by doctors having an imperfect technic or who do not carefully select hemorrhoids to be injected one or several of the following complications may ensue:

Intense pain.

Prolapse of inflamed hemorrhoids.

Strangulation of tumors.

Sphincteralgia.

Ulceration or sloughing of injected piles and adjacent structures.

Phlebitis.

Abscess.

Fistula.

Septicemia.

Embolism with paralysis or death.

Alarming hemorrhage.

Impotence.

Rectal stricture.

Septic pneumonia.

Partial or complete destruction of the sphincter ani.

Prolonged convalescence.

No relief or imperfect cure.

The *mortality* following the injection treatment of hemorrhoids is about  $\frac{1}{5}$  of 1 per cent., and would be less if the procedure was more carefully practised in selected cases.

Regarding the *prognosis* of the injection treatment of piles it may be said that a permanent cure is obtained in less than 5 per cent. of cases.

The author has mentioned 2 patients seen by him who died from septic pneumonia following the injection of external hemorrhoids by itinerants, and he knows indirectly of 3 others where death ensued within three days following the injection of piles with carbolic acid probably the result of embolism.

Edmund Andrews collected 3304 cases of hemorrhoids treated



by the injection method summarized below, which gives the reader a fair idea of the mortality and complications to be expected from this procedure:

Deaths.....	13
Embolism of liver.....	8
Sudden and dangerous prostration.....	1
Abscess of liver.....	1
Dangerous hemorrhage.....	10
Permanent impotence.....	1
Stricture of the rectum.....	2
Violent pain.....	83
Carbolic acid poisoning.....	1
Failed to cure.....	19
Severe inflammation.....	10
Sloughing and other accidents.....	35

The injection method is not uniformly *curative*, nor does it always *temporarily* arrest bleeding or protrusion of hemorrhoids.

In successful cases symptoms disappear for from a few months to three and occasionally five years. The author has seldom encountered individuals where relief lasted for a longer time.

Except when demanded by the patient the injection treatment is undesirable because it is tedious and weeks are required to relieve a patient who could be cured in a few days by a *local anesthesia* operation, and the method is also objectionable because inexperienced physicians and laymen believe themselves capable of curing piles with it, when, in reality, the procedure often requires greater dexterity than a radical operation and is much more dangerous when injections are incorrectly made. Most serious results follow when the needle, after passing through the pile, penetrates the rectal wall and carbolic acid is deposited into the *perirectal space* and must slough out (Fig. 329).

By observing the following rules before, during, and following the injection of piles with *carbolic acid* or *quinin* and *urea* the patient is saved much unnecessary suffering and better results are obtained:

1. Carefully examining the anal canal and locating hemorrhoids to be injected.
2. Emptying the bowel with a light laxative followed by a low enema preceding the treatment.
3. Placing the patient comfortably in the left Sims' posture.
4. Swabbing mucosa and perianal skin with surgical iodine.
5. Smearing the lower rectum and perianal skin with a sedative ointment to protect it from escaping acid and to diminish post-operative pain.
6. Reducing prolapsed hemorrhoids.

7. Previously divulsing the sphincter under nitrous oxid gas when very tight or irritable.

8. Exposing tumors to be injected through the window of the author's anoscope (Fig. 71) or a slide speculum (Fig. 330) as the patient strains or coughs.

9. Employing a sterilized syringe fitted with a Gant goose-neck extension and large caliber sharp-pointed needle, having a shoulder that prevents its deep insertion (Fig. 330).



Fig. 330.—Author's technic of injecting hemorrhoids with quinin and urea, carbolie acid, or other solution with aid of a slide speculum or the author's operating anoscope (see Fig. 331) and goose-neck syringe.

10. Forcing all air out of the syringe and needle before puncturing the pile.

11. Using a fresh carefully made filtered solution.

12. Injecting the solution slowly into the base or, preferably, pendulous portion of the hemorrhoid (Fig. 330).

13. Never injecting more than one pile at a sitting.

14. Accurately gaging amount of the solution, employing 5 (0.3)

for *small*, 10 to 15 (0.6–1.0) for *medium*, and 20 to 30 minims (1.3–2.0) for *large* pile tumors.

15. Leaving needle in until the pile turns white after injecting the hemorrhoid to allow for coagulation and forestall leakage.

16. Pressing the finger upon the puncture opening as the needle and speculum are quickly withdrawn to prevent immediate escape of the fluid.

17. Not depositing carbolic acid or quinin and urea in the submucosa, beneath the integument, in skin or perirectal tissue as is done when the needle penetrates the rectal wall.

18. Returning hemorrhoids having a tendency to prolapse well above the anal muscle.

19. Preventing extrusion of distended tumors by supporting the anus with a cotton or gauze pad held in place by a T-binder.

20. Having the patient rest in the recumbent posture until comfortable.

21. Quieting pain and sphincteric spasms by hypodermic injections of morphin, gr.  $\frac{1}{4}$  (0.016), or occasional insertion of a suppository containing morphin or cocain and belladonna, gr.  $\frac{1}{8}$  (0.008), and applying hot-water fomentations over the anus.

22. Making injections a week or more apart.

23. Procuring semisolid daily evacuations with oils, saline, or mild dinner pill.

24. Requiring the patient to maintain regular hours, eat moderately, abstain from alcoholics, and forego violent work and exercise.

25. Advising the sufferer to forego straining at all times.

**Composition of Solutions Used in the Injection Treatment of Internal Hemorrhoids.**—Numerous irritant, cauterant, and astringent solutions have been injected into hemorrhoids with varying success, but men of experience employ quinin and urea (5–10 per cent.) or carbolic acid—phenol in some form.

The object sought by the injection is to cause *induration* followed by *shrinking* or *sloughing of the tumor*, either of which temporarily arrests bleeding and partially or completely prevents protrusion of pile tumors.

These purposes are satisfactorily accomplished with quinin and urea (5–10 per cent.) alone or in combination with salicylic acid, borax, iodine, hydrastis, ergot, or glycerite of lead, but the author has obtained better results when the last-named drugs were omitted from the solution. Carbolic acid may be diluted with water, glycerin, olive or almond oil, but glycerin has proved most satisfactory in the author's practice.

Some authorities on the injection treatment, including Yount, employ a *weak*, 3 to 5 per cent., and others, like Agnew, use a *strong*, 50 per cent. solution, but most surgeons using it inject a carbolic acid solution varying in strength from 10 to 30 per cent.

The author prefers the following formula, made fresh for each treatment:

R̄.	Phenol liq.	}	.....āā	3j	4	0.—M.
	Glycerinum					
	Aqua destillata					

Sig.—Inject from 5 to 20 drops, depending on size of the hemorrhoid.

Of numerous carbolic acid combinations and quinin and urea solutions employed in the injection treatment of internal hemorrhoids the following are the most widely known:

SHUFORD'S:						
R̄.	Sodii biboratis	}	.....āā	3j	4	0;
	Acidum salicylicum					
	Glycerinum			3j	30	0;
	Phenol liq.			3ij	12	0.—M.

YOUNT'S:						
R̄.	Phenol liq.			gr. xxiv	1	9;
	Aqua destillata			3j	30	0.—M.

OVERALL'S:						
R̄.	Fl. ext. ergotæ	}	.....			Equal parts.—M.
	Phenol liq.					
	Oleum olivæ					

AGNEW'S:						
R̄.	Plumbi acetas	}	.....āā	3ij	8	0;
	Sodii biboratis					
	Glycerinum					
				3j	30	0.

Mix as follows: Place the container in warm bath for fifteen minutes to hasten the solution of salts, and allow mixture to stand for twenty-four hours. Glycerin and graduate are warmed to facilitate accurate measurements, and other ingredients are added. A sufficient quantity of Calvert's No. 1 crystallized carbolic acid is now liquefied by heat, and 1 ounce (30 c.c.) taken and mixed with 2 drams (8 c.c.) of distilled water. A sufficient quantity of lead glycerid and borax (see prescription above) previously prepared is then added to make 3ij (60 c.c.).

R̄.	Phenol crystallisatus	3j	30	0;
	Aqua destillata	3ij	8	0;
	Sodii biboratis et plumbi glyc.	3vj	24	0.—M.

BRINKERHOFF'S:				
R.	Phenol liq.	3j	30	0;
	Zinci chloridi	gr. viij	0	53;
	Oleum olivæ	3v	150	0.—M.

TUTTLE'S:				
R.	Phenol liq.....	3ij	8	0;
	Acidum salicylas.....	3ss	2	0;
	Sodii biborate.....	3j	4	0;
	Glycerinum (sterile).....	q.s. ad. 3j	30	0.—M.

R̄. Quinin and urea solution—5 to 10 per cent. (*Terrell*).



Generally not more than five to ten injections are required to arrest bleeding and prevent hemorrhoids from extruding. The injection treatment is contraindicated in pregnant women, old people, and children, and when the patient suffers from another rectal ailment, both of which can be simultaneously cured by a simple local anesthesia operation.

Collier Martin, Albright, and others frequently divulse the sphincter under gas before injecting piles, but the author has never found this necessary, and has been able to prevent pain and arrest sphincteric spasms with sedative agents employed in the palliative treatment of internal hemorrhoids. He holds that if gas and stretching the sphincter are necessary it would be preferable to perform a *radical operation* while the patient is asleep and permanently cure him.

**Postoperative** treatment following the injection of piles with carbolic acid is practically the same as that employed in the *non-operative* treatment of bleeding, inflamed, protruding, or strangulated internal varicose hemorrhoids outlined in the preceding pages.

For the relief of pain consequent upon the injection of hemorrhoids Albright as a routine introduces a suppository composed of the following drops, every three to six hours as long as may be necessary:

R.	Ext. opii pulv.....	gr. j	0 06;
	Ext. hyoseyami pulv.....	gr. j	0 06;
	Chloretone.....	gr. j	0 06.
	Ol. theobromatis.....	q.s.	
Ft. suppos. No. j.			

Sloughing tissue is removed with scissors when extensive, and with calomel applications when adherent.

Where the acid has been accidentally deposited outside the rectum or has been injected into or beneath skin, causing gangrene or formation of abscess, the patient quickly becomes profoundly ill or dies unless involved parts are immediately laid open, necrotic tissue is removed with curet or scissors, and free drainage is established.

The author's goose-neck syringe shown in Fig. 331 is useful for injecting hemorrhoids with carbolic acid or quinin and urea and infiltrating them with eucain in local anesthesia operations, because the operator at all times can follow direction of the needle point and the barrel of the syringe does not obscure the operative field.

In concluding his remarks on the injection treatment of hemorrhoids the author wishes to reiterate that the procedure is some-

times curative, and one is justified in risking danger and employing it where for any reason the patient declines to submit to a safer and more reliable operation.

*Quinin and urea (5–10 per cent.) gives as good or better results than carbolic acid solutions when injected into properly selected internal hemorrhoids*, is less often complicated by distressing manifestations, never causes death, and is seldom followed by sequelæ, hence quinin and urea, though not so well known, is preferable to carbolic acid solution in the treatment of internal hemorrhoids and procidentia ani.

The author occasionally employs the injection treatment in office cases and sometimes resorts to quinin and urea injections in

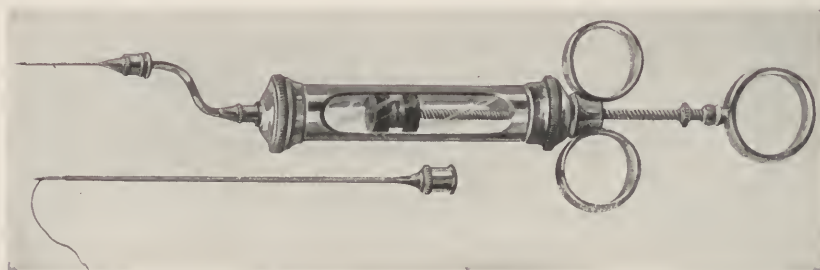


Fig. 331.—Gant's small glass goose-neck syringe employed in the injection treatment of hemorrhoids with carbolic or quinin and urea solutions. He preferably employs the shouldered needle, which enters the pile without penetrating the rectal wall.

getting rid of a small pile overlooked during operation, and for taking up slack in congested mucosa of the anal canal which might later become the site of hemorrhoids.

The edges of ulcers resulting from injections of tissue with quinin and urea are *indurated* and wounds made by them sometimes *slough* and *always heal slowly*. When the solution is retained it sets up an inflammation in the hemorrhoid which causes it first to enlarge, become indurated and sensitive to touch, and later to shrink up; injections are made at intervals every few days or until bleeding and protrusion cease, but must not be repeated until inflammation, swelling, and sphincter algia resulting from the previous treatment have subsided.

## Chapter XXXIII

### Hemorrhoids (*Continued*)

#### INTERNAL VARICOSE—VENOUS—AND EXTERNO-INTERNAL HEMORRHOIDS

##### SURGICAL TREATMENT

**General Remarks.**—Many individuals choose palliative measures or injection treatment in preference to *radical* operation because they believe the latter procedure is tedious, bloody, requires general anesthesia, is accompanied and followed by great suffering, necessitates their going to the hospital for several days or weeks, requires them to undergo considerable expense for room, private nurses, and dressings, and will keep them from business and social duties longer than they desire.

Some physicians and surgeons hesitate about removing piles because they are afraid the operation will be accompanied or followed by alarming hemorrhage, infection, stricture, or other complication.

There is no longer excuse for patients declining surgical intervention or surgeons being timid about operating, because with improved technic employed by experienced up-to-date proctologists *hemorrhoidal operations are almost painlessly performed in ten minutes under local anesthesia at the office, home, or hospital without causing severe postoperative pain or keeping the patient in bed or from business for more than from one to four days, and with the assurance that a permanent cure will follow.*

The author has for years employed *local* in preference to *general* anesthesia in the operative treatment of practically all piles unless complicated by another anorectal affection or lesions elsewhere requiring surgical attention.

A large experience has shown that patients lose their terror of an operation when informed that ether is unnecessary, they need not remain home or in the hospital but a few days or not at all, and will subsequently suffer very little.

Palliative measures and the injection treatment temporarily arrest bleeding and protrusion, but are objectionable because they do not completely destroy all varicosed hemorrhoidal veins, and

patients relieved by them will again suffer from an attack of "piles" within from *three to five years*. A cure nearly always follows removal of hemorrhoids by standard procedures, but the author has observed piles to recur following the *ligature, clamp and cautery, modified excision, Whitehead's*, and other operations where the surgeon's technic was poor, hemorrhoidal tissue was left, or relaxed mucosa had not been excised.

Often *predisposing* and *exciting* causes of piles are not removed during or subsequent to hemorrhoidectomy, and as a result newly formed and older veins may enlarge again, forming hemorrhoidal tumors in from five to twenty years. In 10 instances the author performed hemorrhoidal operations on patients in whom the *so-called pile-bearing area* had been removed from three to ten years previously by Whitehead's operation, which shows that this procedure is not the infallible operation surgeons believe it to be.

Unless the operator's surgical technic is good, his postoperative treatment faultless, and he removes predisposing causes the patient years later may have a recurrence of piles irrespective of the operation performed.

Following the ligature and clamp and cautery operations there has been a recurrence in  $\frac{1}{8}$  of 1 per cent. of the thousands of cases operated on by the author, and usually where a second operation was required the patient suffered from obstinate constipation or obstructive disease of the heart, liver or intestine, stricture, coloproctitis, or procidentia recti.

Many surgical procedures are employed in the radical treatment of hemorrhoids, some of which have little to recommend them and others differ but slightly in their technic.

The ideal operation is one that is curative, quickly performed under local anesthesia, seldom accompanied or followed by hemorrhage, causes minimum postoperative pain, confines the patient to the house for a short time, and does not leave sequelæ.

**Unfavorable Conditions for Hemorrhoidal Operations.**—Sometimes the condition of the patient or rectum must be carefully considered in connection with hemorrhoidal operations.

*Age.*—The author has successfully removed hemorrhoids from patients of all ages up to eighty years without serious complications, but cautiously selects and hesitates to operate very old people having heart trouble, arteriosclerosis, nephritis, diabetes, angina pectoris, or wasting disease because, owing to their lowered vitality, healing is slow, death from shock following a slight operation has occurred, and pneumonia, active nephritis, sometimes ensues when a general anesthetic—ether—is administered. In the



author's practice the removal of hemorrhoids has never caused death, but one of his elderly patients died during postoperative treatment from diabetic coma.

*Plethoric Individuals.*—Some authorities decline to operate on fat subjects, claiming bleeding is beneficial, which is a mistake, since alarming hemorrhage may ensue that could have been prevented by a slight local anesthesia operation.

*Diabetes and Nephritis.*—One hesitates about operating on patients in the last stages of diabetes or Bright's disease because diabetic subjects may die from convulsions, coma, exhaustion, or sloughing before healing takes place, which is always slow; deaths from uremia have been reported.

*Locomotor Ataxia, Paraplegia, and Hemiplegia.*—Protrusion and hemorrhage are frequently annoying in these conditions and some surgeons advise against operation, but the author in these cases quickly removes piles under local anesthesia, which relieves suffering without endangering life.

*Rectal Cancer.*—External and internal hemorrhoids frequently complicate anorectal malignancy, but one is not justified in removing them unless bleeding is dangerous or they cause excruciating pain, for unless the cancer is excised at the same time piles soon recur or the patient dies from malignancy.

*Pregnancy and Abdominal Tumors.*—Pregnancy and large abdominal tumors aggravate hemorrhoids by obstructing hemorrhoidal veins, and some surgeons decline to operate under such circumstances, claiming protrusion and bleeding will cease after delivery or following removal of the tumor; some relief is gained in this way, but annoyance from fully developed piles continues until tumors are excised.

The author, having operated on hundreds of pregnant women without inducing miscarriage, no longer hesitates during pregnancy about removing bleeding, protruding, or strangulated piles under local anesthesia.

*Tuberculosis of the Lungs and Rectum.*—Under no circumstances are piles operated under general anesthesia in persons greatly debilitated by pulmonary or anorectal tuberculosis, since ether often aggravates *latent tubercular foci* in the lungs and the patient's general health rapidly runs down and wounds heal slowly or not at all, owing to the subject's weakened condition. In such cases protrusion and bleeding are controlled by palliative measures or piles are ligated and excised under infiltration anesthesia without confining the patient in-doors more than one or two days.

**Preparation for Hemorrhoidal Operations.**—Elaborate prep-

aration is unnecessary where hemorrhoids are to be removed by the *ligature or clamp and cautery operation* under local anesthesia.

When the operator contemplates doing a *modified excision*, *Whitehead's*, or any other operation requiring stitching, two days' preparation is advisable that the colon and rectum may be cleared of feces by laxatives or enemata and the bowel tied up with an opiate or astringent to avoid soiling of the wound with fluid feces during or following operation.

For other operations the author prescribes a mild laxative the night before and a 6-ounce soapsuds enema half an hour preceding operation; the buttocks are not shaved because outgrowing hair stubs cause considerable annoyance and the patient is not required



Fig. 332.—Author's method of retracting the scrotum in anorectal operations with aid of a 2-inch gauze bandage. The looped extremity may be placed around the patient's neck or held by an assistant after the bandage has been attached to the scrotum by a slip-knot.

to enter the hospital until a few hours before operation. In the operating room the rectum is swabbed with an antiseptic and the perianal skin is painted with surgical iodine.

*Position of Patient.*—For local anesthesia hemorrhoidal operations the exaggerated left Sims' posture (Fig. 60) is preferable unless piles are to be removed by the clamp or cautery or excision operation, when the patient is placed in the recumbent posture with knees flexed (Fig. 61). The lithotomy position is convenient for the surgeon, but uncomfortable for the patient, and is seldom employed except when the operation is performed under general anesthesia. Retracting the scrotum as shown in Fig. 332 saves the operator much annoyance.

*Anesthesia.*—Unless complicated by another affection or the

patient demands general narcosis the author invariably removes hemorrhoids under *local anesthesia*, which is painlessly accomplished with or without sphincteric divulsion, a procedure of doubtful advantage to proctologists accustomed to operating under infiltration anesthesia.

Solutions of eucaïn, procain, cocain, stovain, novocain, quinin and urea, apothesine, and other local anesthetics in different strengths have been employed by the author in thousands of anorectal operations, and of these agents he prefers a  $\frac{1}{8}$  of 1 per cent. eucaïn solution which in every case thoroughly anesthetizes pile tumors in ten seconds without causing toxic manifestations.

The author has successfully performed more than a thousand ligature, clamp and cautery, or modified excision hemorrhoidectomies under *eucaïn anesthesia* ( $\frac{1}{8}$  of 1 per cent.), and frequently removed piles following their infiltration with *sterile water*, but eucaïn is preferable to *water anesthesia* because the initial injection of the latter induces greater discomfort than the former.

Hemorrhoids are almost painlessly removed with a quinin and urea solution, which minimizes postoperative pain, but the author prefers eucaïn, which is always effective, causes less preliminary pain, anesthetizes the tumors more quickly, and is not followed by sloughing or delayed healing of the wound frequently observed following quinin and urea infiltration.

*Adrenalin* is seldom employed in the author's anorectal local anesthesia operations, since it first causes *contraction* and later *relaxation* of vessels, and he prefers to have an *immediate* rather than *late* hemorrhage, so that bleeding may be seen and controlled before dressings are applied.

A combined adrenalin and eucaïn, procain, or apothesine solution is preferred for lengthy anorectal and more particularly abdominal operations, because the former extends duration of the anesthesia.

Best results are obtained when enough of the solution is injected to turn the tumors *white*, which indicates complete analgesia.

Piles are not thoroughly desensitized by spraying them with an ethyl chlorid or making direct strong novocain, cocain, eucaïn, or quinin and urea applications to the tumors, but complete anesthesia is always obtained in a few seconds without toxic symptoms when they are *infiltrated* with a weak eucaïn or procain solution until blanched, which indicates desensitization of tumors.

Surgeons often make the mistake of telling patients they will not feel pain during local anesthesia operations, and in consequence

they jump, scream, or squirm when the initial injection is made. The author invariably informs them that introduction of the needle into the pile will cause a slight pricking sensation, but otherwise the operation will be painless.

Discomfort incident to needle punctures is minimized by squeezing tissues between finger and thumb, touching the skin with carbolic acid, or spraying it with ethyl chlorid, which is objectionable, since suffering incident to freezing is greater than that caused by insertion of the needle and subsequent operation.

The first drops of the solution are *slowly deposited between layers of the skin* or into the mucosa before the tumor is infiltrated (Fig. 333) to avoid distention pain that ensues when piles are suddenly distended with the solution.



Fig. 333.—Photograph showing edematous appearance of an external hemorrhoid caused by distention of the tumor with the anesthetic. Note the glassy white appearance of the pile, which denotes complete anesthesia.

When two or three piles extrude they are infiltrated in turn, so that by the time one is removed the others are anesthetized.

Local anesthesia operations are unsatisfactory and painful when the anesthetizing agent is injected into or behind the rectal musculature or is permitted to escape through multiple needle punctures, an ulcer, fissure or fistulous opening, or cut before piles have been desensitized.

One should bear in mind that analgesia incident to infiltration anesthesia *is due to distention* (Fig. 334) *exerted by the injected fluid* as well as to the *chemical action* of the drug employed, and because of this a *weak* is preferable to a *strong* solution because a greater quantity of the anesthetic can be employed without causing toxic symptoms.

A reliable *syringe* (Fig. 434) having a well-adjusted piston,



tight joints, Gant's goose-neck attachment (Fig. 535), and attached sharp-pointed, reinforced, shouldered needle are essential for successful hemorrhoidectomies performed under infiltration anesthesia.

The syringe shown in the accompanying illustration (Fig. 336) has been satisfactorily employed by the author for several years, and his *goose-neck attachment* is very useful in hemorrhoidal and other anorectal operations where tumors or lesions are infiltrated through a speculum or author's anoscope (Fig. 72), because it enables the operator at all times to keep the needle point in view, which is impossible when the needle is attached to the barrel in the usual way, because the syringe blocks the operator's view.

Reinforced steel or gold needles having a reasonably large caliber and shoulder (Fig. 334) are preferable to ordinary hypodermic variety because they do not clog, bend or break, and the shoulder prevents their being forced too deeply into the pile or through the rectal wall or into tissue being operated upon.

It is convenient but not necessary for piles to protrude, because they are easily infiltrated through a speculum window or slanting anoscope (Fig. 71) and withdrawn with sponge forceps, or when their lower margin is visible, insertion of the needle and distention of the tumor causes it to extrude through the anus.

The anesthetic agent is carefully sterilized and filtered to prevent blocking the needle and the solution is used warm because the injection of cold induces greater pain than warm solution. Novices *quickly inject too much* of the anesthetic, which causes unnecessary pain and distends tissues to such an extent that tumors *blend*, making it difficult to decide where the operation should begin and how much tissue ought to be removed.

Infiltration always changes the size and contour of internal and external hemorrhoids and the operator gages the amount of tissue to be excised before he begins cutting, and the line of incision for skin piles may be previously indicated by methylen-blue or iodine markings. Unnecessary pain is avoided by confining the operation to tissue made *white* by infiltration, for if unanesthetized *pinkish* mucosa or skin is incised or caught in forceps the patient will scream from pain.

Eucaïn is non-toxic, keeps indefinitely, can be resterilized many times without interfering with its effectiveness.

When surgeons do not succeed in painlessly removing piles under local anesthesia it is because they do not *understand the technic*, for all varieties of hemorrhoids can be radically removed successfully under infiltration anesthesia with little or no discomfort.

**Methods of Bringing Hemorrhoids Down for Operation.**—Some operators resort to general narcosis because they are unfamiliar with methods employed to bring piles into view for removal under local anesthesia, which requires considerable ingenuity. Operating is always difficult and results unsatisfactory unless pile tumors are fully exposed before or following anesthetization that all may be completely excised.

Piles are brought down by one of the following procedures: (a) with a suction pump (Fig. 320), (b) extruding them with fingers



Fig. 334.—Method of extruding hemorrhoids with fingers introduced into the vagina.

placed in the vagina (Fig. 334), (c) introducing several rosin-covered gauze tampons through the proctoscope and withdrawing them simultaneously following removal of the instrument (Fig. 335), (d) rolling infiltrated tumors out by tilting needle or speculum (Fig. 338), (e) exposing and injecting high tumors through the window of a speculum or author's anoscope and seizing and pulling them out with sponge forceps (Fig. 341), (f) having the patient strain while buttocks and anal margins are separated with the thumbs, (g) administering a small enema and requesting the patient to keep them out until he gets on the table, (h) hooking

them out with the index-finger when tumors are large and somewhat pedunculated, (*i*) extruding them with the author's inflatable bag (Fig. 321), (*j*) making traction on the perianal skin following introduction of a tractor (Fig. 322), (*k*) tipping them out with end of a speculum after they have been infiltrated (Fig. 338).

**Division and Divulsion of the Sphincter in Hemorrhoidal Operations.**—The author seldom has occasion for cutting or divulsing the anal muscle unless hemorrhoids are complicated by fissure, ulcer, or anorectal affection. When necessary the sphincter is painlessly stretched or incised under local anesthesia by inserting the

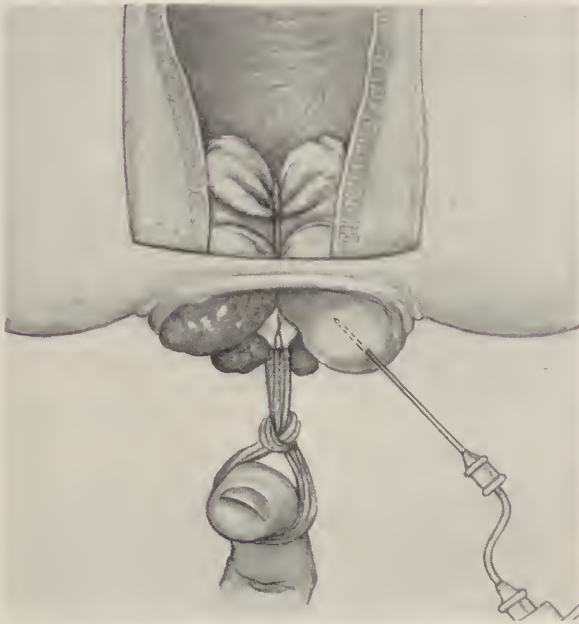


Fig. 335.—Method of everting hemorrhoids by traction made upon tampons introduced through proctoscope.

needle at a point  $\frac{1}{2}$  inch (12.70 mm.) posterior to the anus and infiltrating skin, mucosa, and anal canal along the median line without withdrawing it and then pushing the needle first in one direction and then another, until the posterior half of the rectum including the sphincter has been anesthetized (Fig. 351). When this has been accomplished the needle is withdrawn and reintroduced in front of the anus, following which the anterior half of the sphincter and anal canal are similarly infiltrated. The process requires about five minutes, is painless, effective, and permits the operator to split or thoroughly stretch the sphincter, anal canal, and levator ani

muscle with fingers, dilators, or operating speculum, which enables him to explore the rectum, grasp, and bring down hemorrhoids for radical operation.



Fig. 336.—Method of rolling hemorrhoid into view by tipping the needle-point as the tumor is distended with the anesthetizing solution.

Years ago when the author performed hemorrhoidal operations under general anesthesia he always *divulsed the sphincter*, with



Fig. 337.—Internal hemorrhoid distended, anesthetized with cucain, and ready to be brought out with forceps or everted by tipping the end of the speculum.

the object of minimizing or preventing postoperative pain and retention of urine; but since he modified his technic and began



removing piles under local anesthesia he has not found it necessary to put the anal muscle at rest.

Since the author discarded heavy plaited silk for linen ligatures, stopped tying three knots, began dissecting piles from their attachment and tying only vessels and mucosa, discontinued using large gauze-covered rectal tubes, and substituted local for general anesthesia, sphincteric divulsion has been abandoned in uncomplicated hemorrhoidal operations, because postoperative pain is slight and catheterization is seldom required.

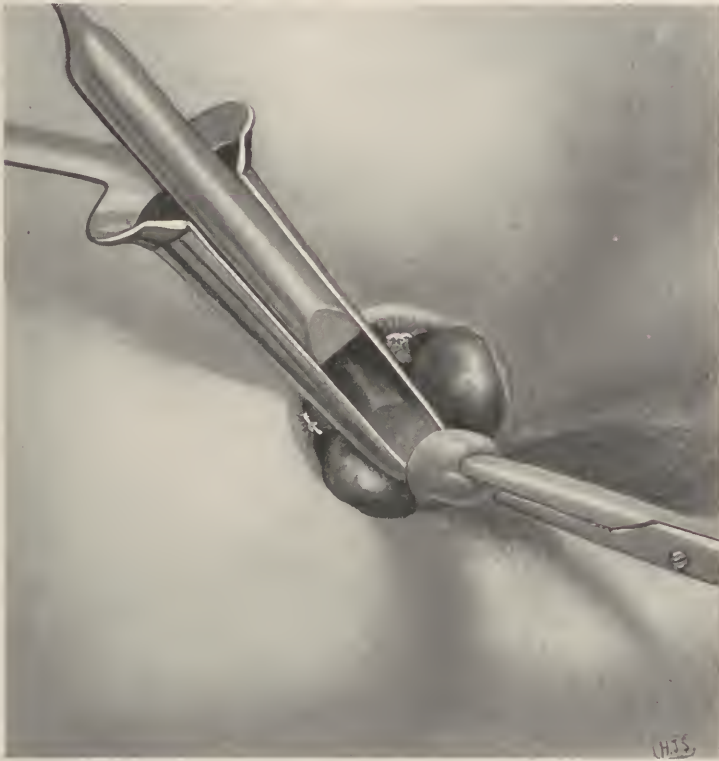


Fig. 338.—Bringing anesthetized hemorrhoids outside with aid of forceps and tilting end of speculum. To the right and left are shown excised pile stumps.

When the lower rectum is irritable or ulcerated divulsion of the anal canal forestalls or lessens postoperative pain and difficult micturition and relieves or cures constipation, but these results are not due solely to stretching the sphincter, because in successful divulsion the anal canal and levator ani muscle are stretched, which facilitates defecation and renders the patient more comfortable during convalescence.

Frequently following anorectal operations where the sphincter only has been divulsed the patient complains of pain, inability to void urine, and of muscular contractions caused by an irritable or hypertrophied levator ani muscle that has not been put at rest. In aggravated cases when the anal canal is narrow and anorectal muscles are sensitive and spasmodically contract on slight provocation the author puts them at rest by splitting the anal canal posteriorly, as in fissure operations.

Divulsion of the anal canal may be *gradually* accomplished with dilators, bougies, or fingers inserted one after the other, or *forcibly* under local anesthesia with thumbs or the author's operating speculum.

**Classification of Hemorrhoidal Operations.**—Having outlined palliative measures and discussed different plans of treating piles with *caustics, cauterization, electrolysis, écrasement, divulsion of the sphincter, crushing, torsion, and injecting them with carbolic acid or quinin and urea* it remains for the author here to consider the surgical treatment of internal varicose hemorrhoids.

Of the many procedures suggested for the radical cure of piles the following operations (including modifications), named in the order of their usefulness, have been most favorably received:

1. Ligature operation.
2. Clamp and cautery operation.
3. Exeision operation.

## Chapter XXXIV

### Hemorrhoids (*Continued*)

#### INTERNAL VARICOSE—VENOUS—HEMORRHOIDS AND EXTERNO- INTERNAL HEMORRHOIDS

#### LIGATURE OPERATION, CLAMP AND CAUTERY OPERATION, EXCISION OPERATION

**Ligature Operation.**—This procedure with slight modifications has been successfully employed in the removal of hemorrhoids for hundreds of years, and is still practised more frequently by experienced surgeons than any other hemorrhoidal operation.

The ligature is the *operation of choice* because few instruments are required, it can be performed under local or general anesthesia in less than ten minutes, is rarely accompanied or followed by profuse bleeding, seldom causes severe postoperative pain or retention of urine, confines the patient to bed only three or four days, and infection, stricture, fecal incontinence, and other sequelæ almost never follow this procedure.

In a previous work the author stated his preference for the clamp and cautery operation because as then performed ligation of hemorrhoids required a general anesthetic, frequently caused severe pain, and often necessitated catheterization of the patient.

These complications have rarely been encountered since he substituted local for general anesthesia and linen for heavy plaited silk ligatures, began tying two instead of three knots, and commenced dissecting piles from their attachment and ligating vessels only (Fig. 345) instead of tying pile tumors *en masse*.

The ligature operation is less often followed by alarming hemorrhage than any other procedures because bleeding vessels are included in the ligature and oozing from skin cuts is quickly controlled by a firm compress (Fig. 346) placed over the anus and supported by a snugly adjusted T-binder.

Bleeding is rare following *local anesthesia* hemorrhoidectomies because the patient does not vomit, strain, or pull out dressings as after ether, chloroform, or gas-oxygen narcosis.

Except when hemorrhoids are complicated by another affection they are always removed under eucain or novocain *infiltration anesthesia*. Since the author began operating under local anes-

thetia he has discontinued other procedures for the ligature operation because it is simple, curative, rarely accompanied or followed by complications, and does not frighten the patient like the clamp and cautery or Whitehead's operation, hence he remains quiet while piles are being removed.

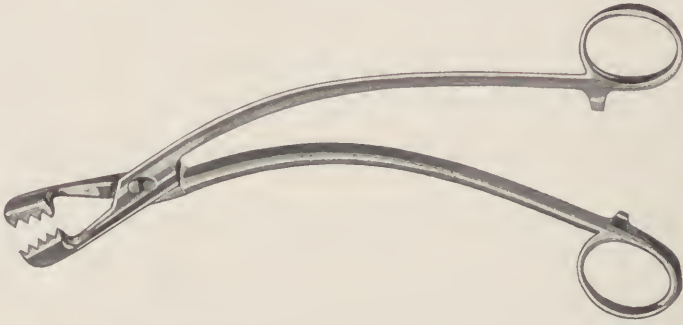


Fig. 339.—Author's hemorrhoidal forceps.

**Technic.**—The ligature operation is attractive because it can be almost painlessly performed under local anesthesia in about five minutes at the office, home, or hospital, and the only paraphernalia required are six pairs of blunt-pointed sponge or the author's hemorrhoidal forceps (Fig. 339), several strands of four-ply harness

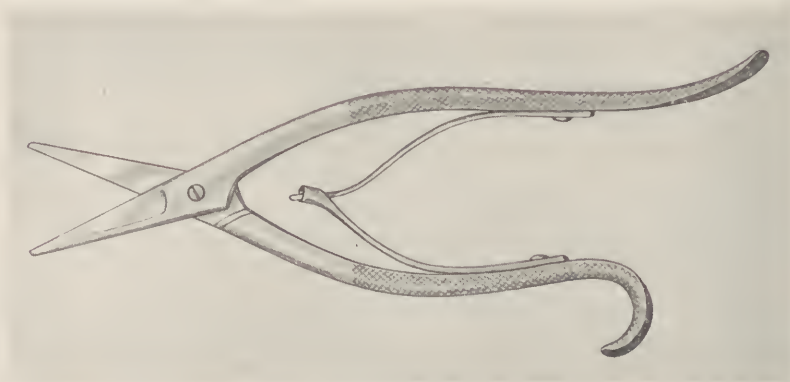


Fig. 340.—Rectal scissors, useful in hemorrhoidal and other anorectal operations.

linen 18 inches long; rectal (Fig. 340) or Mayo scissors; anesthesia syringe (Fig. 342), fitted with a Gant goose-neck attachment (Fig. 341), and sharp-pointed curved needle 2 inches in length, having a large caliber and shoulder a short distance from the end; the author's speculum or anoscope (Fig. 72), through which internal non-pro-



truding hemorrhoids are exposed and infiltrated (Fig. 341) with a  $\frac{1}{8}$  of 1 per cent. eucain or stronger procain solution.

Most surgeons elaborately prepare the patient, employ general anesthesia, devote half an hour or more to the operation, plug the rectum with gauze or large rectal tube, and apply cumbersome dressings when removing hemorrhoids by the ligature method, and afterward tie up the bowel with an opiate or encourage fluid evacuations through the administration of cathartics, procedures that add greatly to the patient's discomfort, favor prolonged convalescence, and invite unsatisfactory results.

During the last fifteen years the author has, when performing the ligature operation, followed the simplified technic given below, which possesses many advantages over the original procedure as still practised by many surgeons.

Preliminary features in the operation consist in cleaning the bowel of feces with a 6-ounce soapsuds enema to remove solid feces, swabbing the rectum with an antiseptic solution, painting the perianal skin with 5 per cent. iodine, placing the patient in the exaggerated left Sims' or lithotomy posture, filling the syringe with eucain, conveniently arranging the necessary instruments, ligatures, and dressings, and giving the patient a hypodermic of morphine, gr.  $\frac{1}{4}$  (0.016), to control postoperative pain which would follow in case the removal of considerable skin became necessary.

When hemorrhoids have not been brought down with the enema they are made to protrude by suction (Fig. 320), eversion of the anus with fingers during straining, pushing them down and out with fingers placed in the vagina (Fig. 334), pulling on gauze tampons introduced into the rectum through a proctoscope (Fig. 335), and tipping the needle or speculum outward as the tumor is distended (Fig. 334).

Following exposure the number, size, and position of each tumor is noted (Fig. 343, insert), so it may be located later should the hemorrhoids retract or be covered with blood during operation, otherwise one or more piles may be overlooked.

When patients are nervous and cannot resist drawing the anus upward, it is advisable to quickly anesthetize all tumors to prevent their slipping above the sphincter, which makes recovery difficult when they are wanted.

The practice of some surgeons in having patients strain during operation is unnecessary and objectionable because continuous bearing down forces the anesthetic from the pile before it is desensitized, makes the patient uncomfortable, increases bleeding, may cause ligatures to slip off, is sometimes followed by the evacuation

of mucus or feces that soil the parts, and because it is not necessary to see the entire tumor when the needle is inserted, since it rolls slowly into view as it is infiltrated (Fig. 343, *A*).

Protruding are more easily dealt with than concealed hemorrhoids, and inability of the surgeon to bring hemorrhoids into view causes him to administer a general anesthetic and divulse the sphincter when removing internal piles. It is immaterial to the author whether tumors extrude or not, because with the aid of certain maneuvers previously described and illustrated (Figs. 337, 341) he is able to quickly and painlessly bring them down whether they are situated near the anus or well up in the anal canal.

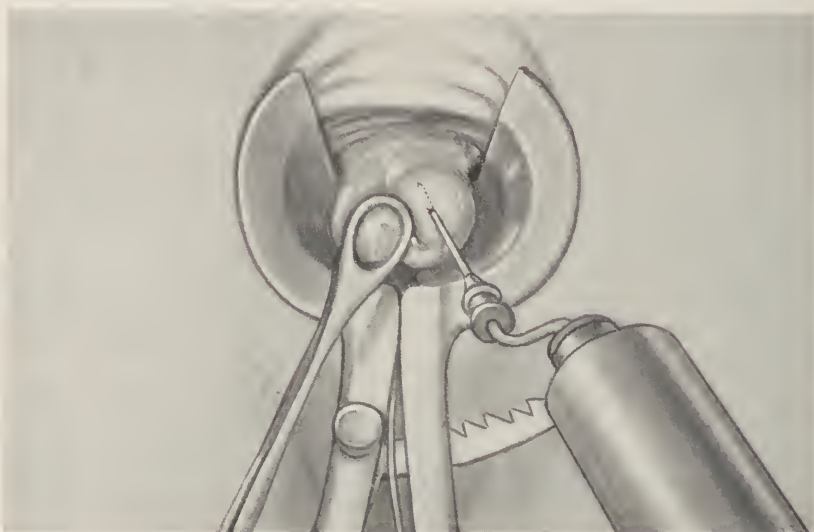


Fig. 341.—Method of distending and infiltrating internal hemorrhoids with the aid of the author's speculum and goose-neck anesthesia syringe, after which they are brought down for operation with sponge forceps.

Hemorrhoids within 1 inch (2.54 cm.) of the anus are quickly brought outside before or following infiltration by introducing a speculum, partially withdrawing the slide, letting the pile drop through the window, and tilting the upper end of the instrument outward as it is withdrawn (Fig. 338), but this procedure is unsuitable for hemorrhoids above this point.

Piles higher up are anesthetized through the opening in the end of the author's slanting anoscope (Fig. 72) or speculum (Fig. 341), using a large plain or needle shouldered near the point to prevent its penetrating the bowel wall, and then drawn into view with the author's hemorrhoidal (Fig. 343, *B*) or sponge forceps (Fig. 341).

Operators inexperienced in this work are often confused regarding the most suitable point to insert the needle and amount of anesthetizing solution to employ when infiltrating external and internal hemorrhoids that vary in size and location.

Using his large metal syringe fitted with his goose-neck attachment, that enables him to keep the needle point constantly in view, the author introduces the needle into the center or dependent part of the pile (Fig. 341) and slowly injects the solution until the

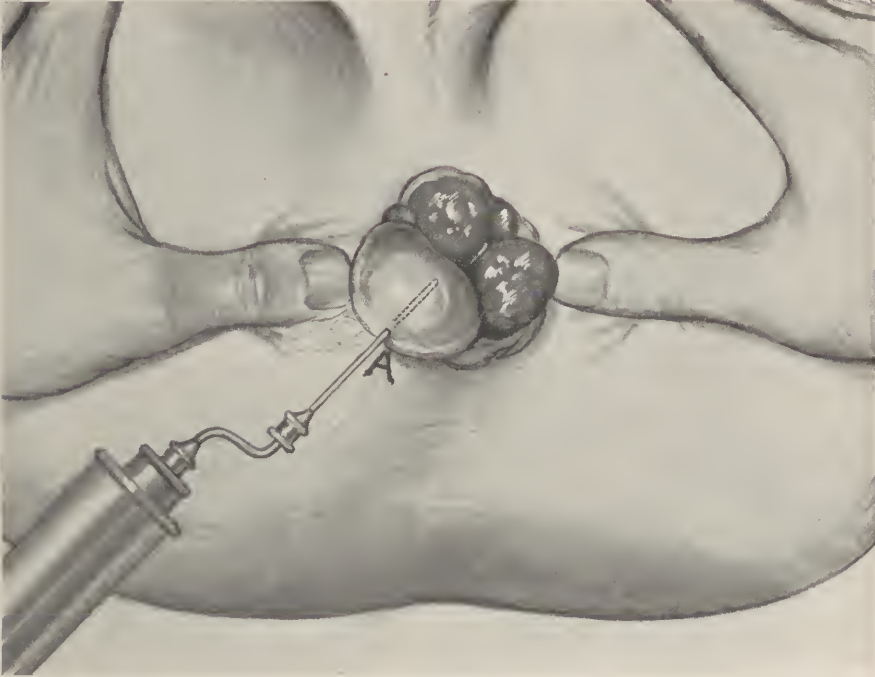


Fig. 342.—Method of anesthetizing protruding internal hemorrhoids. Operation is painless when the needle is made to enter *A*, on the mucous and not skin side of pile, which minimizes pain from the initial injection.

tumor is distended and turns *glassy white*, which indicates complete anesthesia and requires about ten seconds.

When only the lower edge of the hemorrhoid is seen the injection is made at this point, when by tipping the needle point or end of the speculum outward the pile is brought into view (Fig. 342).

To avoid unnecessary pain, owing to the abundant cutaneous nerve supply to the perianal skin and lower  $\frac{1}{2}$  inch (12.7 mm.) of the rectum, the upper or *mucous* side of *combination* and *internal* hemorrhoids are anesthetized (Fig. 342, *A*), after which the needle is directed downward, infiltrating the integument.

Pain incident to needle punctures in the skin is prevented or minimized by applying a drop of carbolic acid to or squeezing integument between the fingers, or by inserting the needle slantingly and avoiding its frequent reintroduction, which permits the solution to escape before anesthesia takes place.

When working outside the anus suffering incident to the initial injection is modified by depositing first a few drops of the solution *between skin layers*, and after waiting ten seconds slowly extending the infiltration into the pile or tissues undergoing operation.

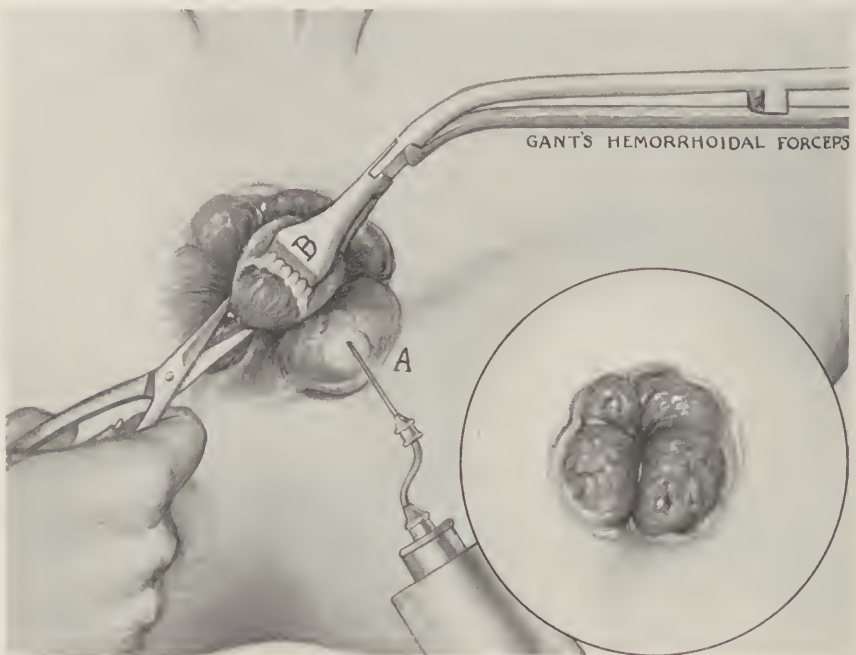


Fig. 343.—Preliminary steps in the author's ligature operation for internal hemorrhoids shown in the insert: *A*, Hemorrhoid being infiltrated with eucaïn; *B*, pile held with a Gant hemorrhoidal forceps while it is being severed from the skin, dissected upward, and made ready for ligation.

Patients being operated on by novices frequently refuse to let the operator continue owing to severe pain due to careless introduction of the needle, rapid distention of tissues, using a cold solution, or employing an unsuitable anesthetic.

The author always tells his patients they will feel needle pricks, but that removal of the tumors will not hurt them, otherwise they squirm upon introduction of the needle.

Most surgeons reverse this plan and without warning jab the needle into the pile, and as a result of his surprise, suffering, and



having been told he would not feel pain, the patient screams, draws out of position, jumps from the table, or refuses to proceed with the operation.

Having previously indicated the manner in which hemorrhoids are brought into view and anesthetized, the author will briefly outline the *steps* of his ligature operation, and afterward discuss special features of the procedure.

*First Step.*—The extruded tumor (Fig. 343, insert) selected is infiltrated (Fig. 343, *A*), caught with sponge or author's forceps

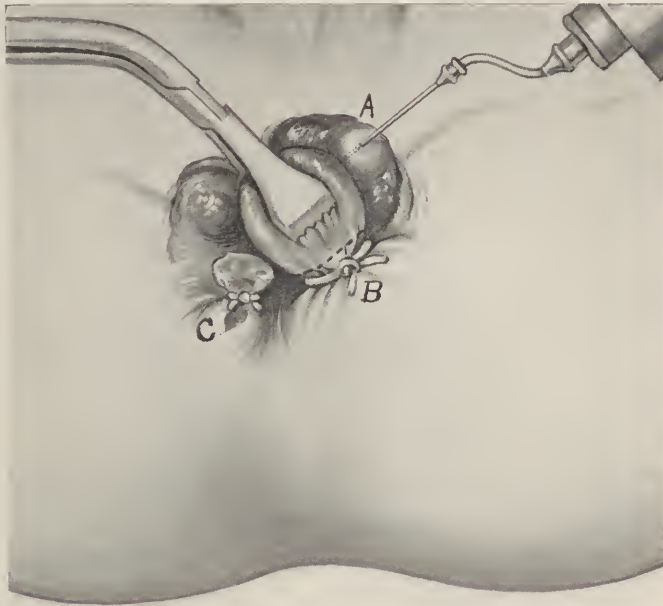


Fig. 344.—Second step in the author's ligature operation for internal hemorrhoids: *A*, Hemorrhoid being anesthetized; *B*, pile ligated and ready for excision at dotted line; *C*, stump left following excision of hemorrhoid.

(Fig. 339), and lifted up or down while skin and pile tissue at the mucocutaneous juncture are severed by a single cut made with rectal scissors (Fig. 340) to prevent or minimize postoperative pain by cutting cutaneous nerves.

*Second Step.*—Hemorrhoid and feeding veins are dissected from their attachments for  $\frac{1}{2}$  inch (12.7 mm.) or more, depending on size of the pile, during which care is exercised to prevent injury to the sphincter and vessels (Fig. 343).

*Third Step.*—After a strand of four-ply harness linen, which is very strong, has been placed beneath the pedicle, the entire pile

with adjacent relaxed mucosa is drawn down and outward as far as possible, when it is ligated (Fig. 344, *B*) and excised, leaving enough stump (Fig. 344, *C*) to prevent slipping of the ligature.

*Fourth Step.*—Skin-tabs and cutaneous piles are eucainized and snipped off unless continuous with internal hemorrhoids, when they are removed along with the varicosities by a *V-shaped* incision and dissection (Fig. 343).

*Fifth Step.*—Hypertrophied anal papillæ, polyps, and other complicating anorectal lesions are treated or removed.

*Sixth Step.*—Copious bleeding is controlled by ligaturing spurting vessels or applying gauze compresses wrung out of boiling water to oozing surfaces, and never by torsion, which lacerates the mucosa.

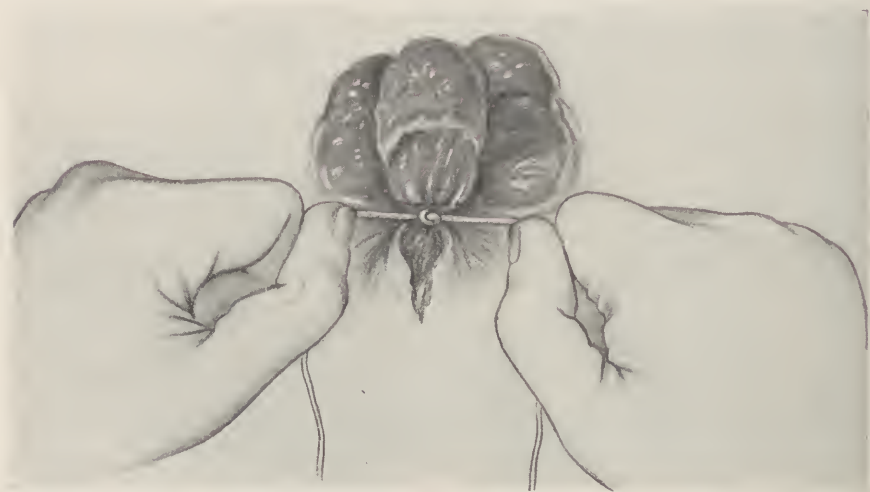


Fig. 345.—Third step: Correct method of ligating the pile pedicle with strong harness linen.

*Seventh Step.*—Hemorrhoidal stumps are returned above the sphincter.

*Eighth Step.*—After covering the anus with a gauze pad over which is placed the author's pyramidal-shaped compress (Fig. 346), dressings are retained in position by a tightly adjusted T-binder, the legs of which cross directly over the anus (Fig. 365).

*Ninth Step.*—Finally, after the patient is in bed, loosened bandage and dressings are tightened, for hemorrhage is prone to occur when firm pressure is not exerted over the anus following these operations.

Mistakes are often made relative to the amount of skin removed in hemorrhoidal operations. Skin-tabs and cutaneous piles

are safely cut away at their attachment, but considerable judgment is necessary as to the amount of tissue one should excise when the integument has been stretched and bulges at several points around the anus.

The author, using scissors (Fig. 343) and making V-shaped incisions, removes only sufficient integument to take all slack out of the skin when the wound is healed. Stricture at or near the anus due to pile operations is usually caused by *the removal of too much integument*, and in such cases postoperative pain is severe.

Surgeons not realizing the thickened purplish or congested ring observed about the anus in hemorrhoidal operations, results caused by divulsion of the sphincter, often remove all or part of it, leaving a denuded circle, the healed scar from which causes a stric-

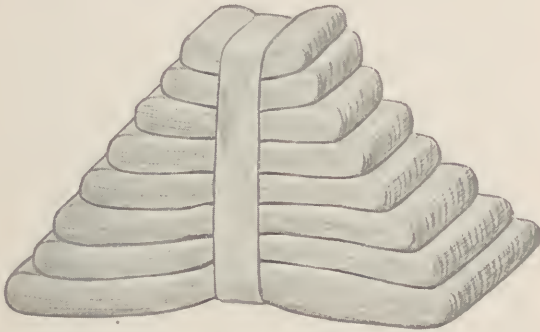


Fig. 346.—Author's pyramidal-shaped gauze compress which prevents or arrests bleeding subsequent to hemorrhoidal fissure and other operations when firmly retained in place by a tightly adjusted T-binder crossed over the anus (Fig. 365).

ture or leaves the patient with a narrow sensitive anus or entangled sphincter, with resulting fecal incontinence.

When dealing with the mucosa the novice frequently errs the other way and does not excise sufficient mucous membrane along with piles to take up the slack which would have acted as a prophylaxis against the formation of new hemorrhoids later. To forestall a relapse under such conditions the author draws the hemorrhoid and relaxed mucosa above it well down with the aid of forceps placed the one above the other before the ligature is tied.

Following V-shaped (Fig. 345) incisions and cuts made at the mucocutaneous juncture with the object of dividing sensory nerves one must proceed cautiously when dissecting internal hemorrhoids from their attachments to avoid the removing of *sphincteric segments* and injuring veins and arteries, which may not be included in the ligature. The anal muscle is easily separated by stripping it

back with the handle of a scalpel as traction is made upon the pile. Accidental troublesome bleeding not controlled by ligature or cautery is arrested by the introduction of a large compact gauze plug inserted through an operating proctoscope. Alarming hemorrhage usually results from the breaking open of cauterized areas, imperfectly tied knots, slipping of ligatures when the hemorrhoidal stump is cut too short, introducing instruments or finger into the rectum subsequent to the removal of piles, displacement of dressings, allowing the patient to go to the toilet too soon, or vomiting and straining following etherization.



Fig. 347.—Method of transfixing and doubly ligating hemorrhoidal stumps too large for a single ligature. (Note the author's special rectal needle which seldom causes bleeding.)

Four-ply harness linen ligatures have in the author's hand proved universally satisfactory in every way, because they are inexpensive, cannot be broken, are easy to adjust, ends flay out and knots are non-irritating, advantages not possessed by plaited silk which becomes hard, causing irritation when wet.

The first or *surgeon's knot* is tied very securely, otherwise the pile may not slough completely off, and care is taken to leave sufficient stump to prevent hemorrhage that might occur from slipping of the ligatures.

When technic of the author's ligature operation is carried out as indicated patients are cured of hemorrhoids in short order with slight discomfort and little delay from business.



If hemorrhoidal stumps are too large for a single ligature, they are transfixed in the center and ligated on either side as shown in Fig. 347.

After ligating and removing hemorrhoids Kyger and Ball thread a needle to one end of the ligature and, after carrying it through the skin edge, bring it out and tie it to its fellow of the opposite side, a maneuver that brings pile stumps and skin edges close together (Fig. 348), which diminishes the size of wounds, hastening convalescence, but the author considers this procedure inferior to the above-described ligature operation, because it is sometimes followed by infection, abscess, and fistula.



Fig. 348.—Ball-Kyger method of diminishing the wound and hastening convalescence by attaching the tied ligature to the skin edge.

When hemorrhoidal tumors are very large they are transfixed with a double ligature and tied on either side (Fig. 347).

**Clamp and Cautery Operation.**—Next to the ligature the clamp and cautery is the best and most popular operation for the removal of internal hemorrhoids. In a former work the author stated his preference for this over the ligature procedure because it was less often followed by retention of urine and postoperative pain was not so great, but since he began operating under local anesthesia and improved the ligature method he has *abandoned* the clamp and cautery operation.

Discomfort from catheterization and postoperative pain that

formerly followed tying off of piles the author has almost entirely eliminated through the substitution of strong linen for heavy plaited silk ligatures, tying two instead of three knots, ligating the hemorrhoidal pedicle only, discarding rectal tubes, and substituting local for general anesthesia.

*Permanent results are as good from one as the other* and urinary retention and postoperative pain are rarely annoying complications of either operation rightly performed. Except when the patient insists on general narcosis the author operates on all uncomplicated hemorrhoids under *local anesthesia* by means of the ligature.

Disadvantages of the clamp and cautery are: the *cautery frequently fails to work at the proper time, an extra assistant is required, patients become afraid of the glowing cautery and refuse to proceed with the operation or keep changing their posture, and post-operative hemorrhage occurs more frequently after this than other hemorrhoidal operations.*

*Postoperative hemorrhage* is frequent unless the operator or nurse is experienced with the procedure, owing to insufficient burning of the tissues, slipping out of the pile stump from the clamp before thorough cauterization has been completed, separation of cauterized edges through sponging or introduction of the finger, instrument, or speculum into the rectum, failure to apply a firm compress over the anus, and not readjusting the dressings after the patient has been placed in bed.

The author employs *local*, but most surgeons do the operation under *general anesthesia*, which is often responsible for copious or alarming bleeding owing to ensuing vomiting and straining or withdrawal of dressings by the patient while unconscious.

Early fluid and constipated movements are more often responsible for hemorrhage following the clamp and cautery than the ligature operation because expulsion of feces pulls wounds apart or dislodges sloughing tissue.

**Technic.**—Since the methods of preparing the patient, placing him in a proper posture, bringing hemorrhoids into view, and anesthetizing piles is the same as in the ligature operation previously described their further elucidation would be superfluous here.

In this procedure all piles are brought into view and isolated with forceps to render introduction of the speculum unnecessary once the operation is begun.

General or local anesthesia may be employed in this procedure, but the author performs the *clamp* and *cautery* operation under infiltration anesthesia in the following manner:

*First Step.*—The tumor is grasped with the author's hemor-

rhoidal or sponge forceps (Fig. 339) and pulled to one side, while skin and sensory nerves at the mucocutaneous juncture are being divided with knife or scissors (Fig. 340) to lessen postoperative pain.

*Second Step.*—The pile is held firmly and moved in different directions as it is dissected from its anal attachment with blunt scissors (Fig. 343).

*Third Step.*—The tumor is drawn down, caught, and tightly compressed between jaws of the author's pile clamp (Fig. 349), pressure being regulated by the thumb-screw (Fig. 349).

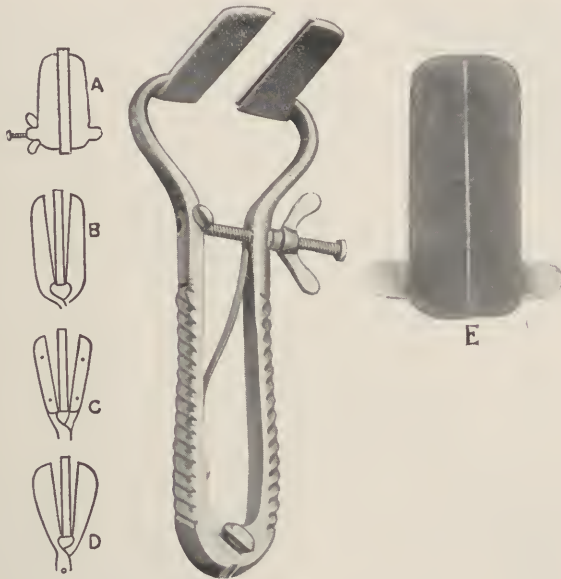


Fig 349.—Author's hemorrhoidal clamp. Center: Full view of Gant clamp. Left: A piece of wood placed between jaws of different instruments to show the advantage of the clamping power of *A*, the Gant, having right-angle blades, to *B*, *C*, and *D*, other pile clamps that work like scissors. As seen, the author's clamp tightly grips the hemorrhoidal stump from one end to the other, while other instruments clamp it tightly only at one end of the blades; *E*, end view of clamp.

*Fourth Step.*—Handles of the forceps and clamp in the left hand are held firmly, while the hemorrhoid is amputated with scissors  $\frac{1}{8}$  inch (3.17 mm.) from the clamp (Fig. 350).

*Fifth Step.*—After being cureted and cleansed to free them of blood, stump edges are *everted* and slowly burned thoroughly inside and out with a Paquelin or Percy cautery point, otherwise they *curl inward* without being cauterized, increasing the danger of immediate or late postoperative hemorrhage upon straining.

*Sixth Step.*—Following removal of all piles the operation is

completed by applying vaselin to cauterized areas, placing a thick gauze pad over the anus, and supporting it with the author's firm *pyramidal-shaped* compress (Fig. 346) held tightly in place by the author's operating harness (Fig. 366) or a strong T-binder, the legs of which are tightly crossed directly over the anus (Fig. 365) to insure a maximum degree of pressure.

There is comparatively little danger from *postoperative bleeding* following the clamp and cautery operation performed by specialists who understand the technic and employ a reliable clamp

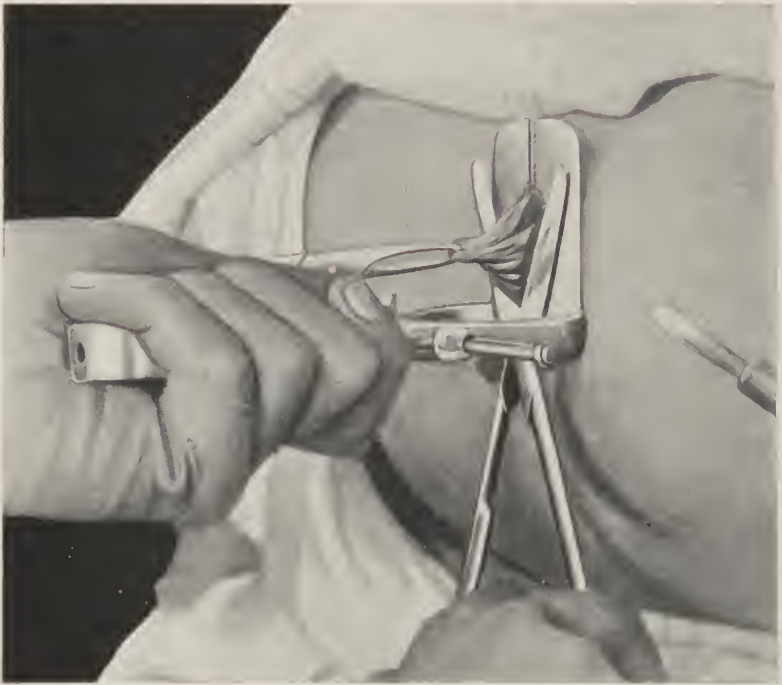


Fig. 350.—Author's clamp and cautery operation being performed with aid of his hemorroidal forceps and clamp.

(Fig. 349), but in the hands of a novice the procedure is many times more dangerous than the ligature operation because alarming hemorrhage frequently follows the procedure.

Inexperienced operators when removing piles by the clamp and cautery method often prepare the way for serious postoperative bleeding by: (a) not identifying all tumors with forceps before their removal is begun; (b) omitting to wipe the rectum dry before operating; (c) failing to thoroughly cauterize pile stump edges *inside* and *out* before the clamp is slowly released to see if



bleeding is controlled; (*d*) sponging cauterized wounds during or after completion of the operation; (*e*) searching with finger or through the speculum for others after some piles have been removed; (*f*) attempting to forcibly return burned hemorrhoidal stumps above the sphincter; (*g*) inserting plugs or rectal tubes; (*h*) applying dressings loosely; (*i*) neglecting to tightly readjust the anal compress and T-binder after the patient has been placed in bed; (*j*) employing *general anesthesia*, which is followed by restlessness, unconscious withdrawal of dressings by the patient, vomiting, and straining, and (*k*) attempting to procure frequent fluid or delayed constipated stools.

Many patients suffer agonizing pain subsequent to careless clamp and cautery operations due to *cauterizing the perianal skin* or buttocks with the cautery point or handle while intent on burning the pile stump.

Infection rarely follows this procedure because burning closes the lymph spaces and destroys septic organisms.

**Author's Hemorrhoidal Clamp.**—Most pile clamps are unsafe because when locked pressure is not equally distributed along the blades and sections of hemorrhoidal stumps slip out near their tips before being cauterized (Fig. 349, *B, C, D*), and hemorrhage ensues; clamps riveted back of the blades like scissors possess this fault (Fig. 349, *B, C, D*).

The principle of the author's clamp differs from others in that blades are set at a right angle to the handle (Fig. 350), and as a result all segments of the pile are caught and compressed equally at all points when the instrument has been closed (Fig. 349, *A*) and the flying screw adjusted (Fig. 349), which eliminates the danger of tissue escaping before being burned. This instrument materially lessens danger from hemorrhage following clamp and cautery operations because it also acts as a *crusher*.

The chief advantages of the author's hemorrhoidal clamp are:

1. It is neat, attractive, and easily handled.
2. Aseptically constructed.
3. Made of steel and does not bend or get out of order.
4. Is quickly adjusted.
5. Never permits clamped tissue to withdraw, which enables the operator to turn the instrument to one side to avoid cauterizing adjacent skin and prevent blood from obscuring the operation.
6. Does not obstruct the view.
7. Possesses a strong self-opening spring and double threaded screw, which when tapped runs down immediately, tightening the jaws.

8. Serves the purpose of speculum and clamp when removing hypertrophied anal papillæ.

9. Can be employed with patient in the lithotomy or Sims' posture.

10. Is adapted for the removal of polyps in the lower rectum or vagina.

11. Is ideally suited for excision of sections of the mucosa and muscular tunics in procidentia recti operations when the wound is cauterized or sutured.

12. Makes an admirable colostomy clamp, since it causes the gut to slough off in from three to five days.

13. It can be substituted for a pile crusher.

14. With it and forceps bleeding anorectal structures can be caught, clamped, and held for cauterization or suture.

The majority of so-called Gant clamps sold by dealers are *useless* or *inconvenient* because they are not constructed of steel after the original model (Fig. 349), being made of brass or composition metal, which bends or breaks when the instrument is tightly adjusted about a large hemorrhoid, or is dropped.

The clamp must be constructed of steel and possess blades and a handle of liberal dimensions, and a large double screw that upon being tapped runs down and locks the instrument as soon as the pile has been grasped (Fig. 349).

Again, makers frequently *place the thumb-screw on the left* side of the clamp, which is wrong, since the right hand must then cross the left when it is adjusted, an exceedingly cumbersome arrangement.

**Excision—Whitehead's Circular and Linear Excision.**—Several surgeons have devised or modified excision operations, none of which has met with general approval, and the author doubts if a popular excision operation will be forthcoming, because any procedure that embraces removal of piles and closure of the wounds with stitches is fraught with danger because infection frequently occurs, sequelæ and complications are common, and results are not so satisfactory as after the ligature or clamp and cautery operation.

General surgeons get into trouble when removing hemorrhoids because they suture wound edges as in other parts of the body where septic organisms are less active, difficulties avoided by the proctologist, who realizes the danger of *closing rectal* and *perianal wounds* and performs the ligature or clamp and cautery operation, which leaves wounds that drain freely, thereby providing against infection. It is impossible to render the anorectal region *aseptic* irrespective of preparations made, and activity of anal muscles and

trauma of the wound by feces during defecation favor the breaking down of sutured wounds.

**Whitehead's Operation—Circular Excision.**—This procedure appeals to the surgeon, but experienced proctologists object to the operation because it is complicated, requires considerable time to perform, includes the removal of healthy with diseased mucous membrane, and is frequently complicated by infection, abscess, fistula, hemorrhage, severe pain, and often followed by distressing permanent sequelæ, pruritus ani, ulceration, fecal incontinence (Fig. 354), stricture (Fig. 355), and everted mucosa (Fig. 357), etc.

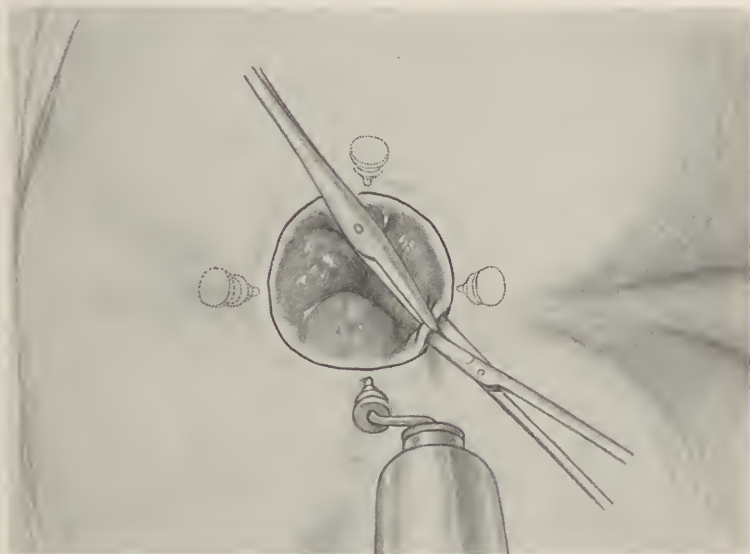


Fig. 351.—Author's technic of anesthetizing the skin and anal canal (for sphincteric divulsion) in Whitehead's operation for hemorrhoids. The line of incision and preliminary step in the operation are shown.

Steps in Pratt's so-called *American operation* are similar to Whitehead's, except dissections are begun in the rectum above instead of at the mucocutaneous juncture, hence the remarks and criticisms made below refer equally to both.

After briefly outlining the *technic* of Whitehead's operation as performed by the author before the procedure was *abandoned*, modifications, advantages, and disadvantages of the procedure will be discussed.

Concisely expressed, the following include the chief steps of the operation:

*First Step.*—The patient is put to sleep or the anal canal is preferably anesthetized by eucain infiltration (Fig. 351).

*Second Step.*—Sphincters are divulsed with fingers until they have no grip and allow piles to extrude through the anus.

*Third Step.*—Using knife or scissors and forceps, or ligature tractors, tissues at the mucocutaneous juncture are severed entirely around the anus, irregularities in the skin being followed (Fig. 352).

*Fourth Step.*—With dissections carried upward for about 2 inches (5.08 cm.) with scissors (Fig. 352) mucous membrane and attached hemorrhoids are freed from the submucosa (Fig. 352), exposing the sphincters and musculature of the lower rectum.

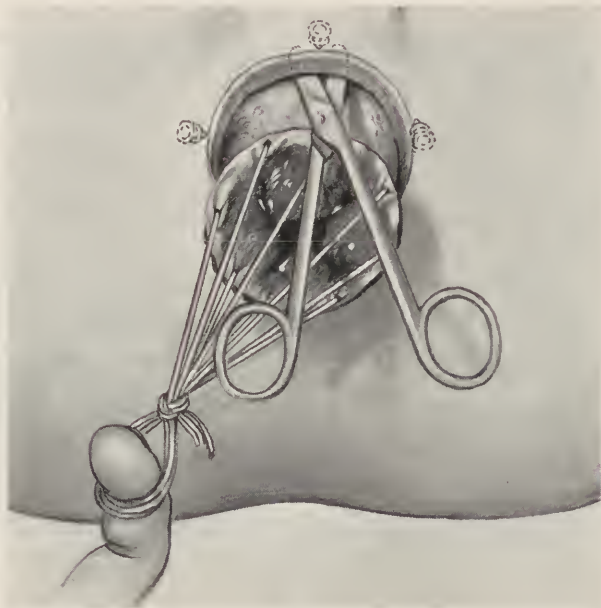


Fig. 352.—Author's technic when performing Whitehead's operation for hemorrhoids complicated by general varicosity of the lower rectum. Scissors are shown freeing mucosa of the anal canal as hemorrhoids are drawn down and outward with aid of ligature tractors and finger.

*Fifth Step.*—After the mucous tube has been brought down and if necessary split to facilitate cutting and stitching, the proximal end is sutured to the skin in successive stages as fast as the pile-bearing area is amputated and a drain is inserted (Fig. 353), following which a large soft-rubber tube covered with gauze, protected by rubber tissue, is introduced into the rectum (Fig. 353).

Whitehead maintains it is easy to separate the sphincter from the mucosa and there is practically no hemorrhage, points upon which the author begs to disagree.

The *hemorrhoidal plexus* in the submucosa, made up of tribu-



taries from the *superior*, *middle*, and *inferior* hemorrhoidal veins, encircles the anal canal and sends venous radicals to the mucosa (Fig. 300).

Whitehead holds that when one set of venous capillaries enlarge and varicose, sooner or later veins on other sides of the bowel will dilate, and upon this theory bases his operation, which consists in removing the so-called "pile-bearing area."

This theory is attractive, but Whitehead's premises are erroneous, and there is just as good reason for *excising all veins in a healthy leg because those of the other are varicosed*, as for removing



Fig. 353.—Author's technic of Whitehead's operation showing approximation of skin and mucosa with catgut lock stitch, drain inserted, and large rubber tube introduced into the rectum about which has been ligated a rubber-covered piece of gauze.

*sound mucosa of the entire lower rectum because a part of it is involved in the hemorrhoidal process.*

The author has operated 20 times for piles where the patient had *previously undergone Whitehead's operation*, and has been called in 40 instances to excise prolapsed mucosa following this or Pratt's operation where the sphincter had been impaired or destroyed by this procedure.

A large experience has demonstrated to the author's satisfaction that recurrence follows the *excision*, *ligature*, and *clamp* and *cautery* operations *with equal frequency*, and that where a cure

is obtained patients are left in a more *uncomfortable* state after Whitehead's procedure than the former.

The author never resorts to the Whitehead or Pratt operation when removing *small or large internal hemorrhoids* because they are destroyed in five minutes under local anesthesia by ligation, with assurance that the patient will be cured and that troublesome sequelæ will not ensue.

When *all veins in the mucosa and submucosa around the entire lower rectum are markedly thickened, dilated, and tortuous* the author occasionally eliminates them by *circular excision* whether the patient has typical hemorrhoids or not, and holds this condition is the *only one* that justifies the Whitehead or Pratt operation.

It remains now for the author to criticize Whitehead's procedure and call attention to the many *complications* and *sequelæ* that frequently follow, whether the operation is performed by a novice or surgeon of considerable experience.

*Objectionable Features in the Technic:*

1. It is not justified for small or large hemorrhoids.
2. Keeps the patient in the hospital for a lengthy period.
3. Elaborate preparation is required.
4. Necessitates two or more assistants.
5. Many instruments are required.
6. General instead of local anesthesia is employed by the average surgeon.
7. Dissections are difficult and tedious.
8. Considerable blood is lost.
9. Sutures, the forerunners of infection, are employed.
10. Mucosa is frequently lacerated, which makes sloughing probable and neat approximation between it and the skin impossible.
11. Compulsory regulation of the diet and stools for days is advisable.
12. Skilful postoperative handling of the patient is essential.
13. A gauze-covered tube, the removal of which causes excruciating pain, is employed to protect the wound and allow gas to escape.

*Frequent and Rare Complications:*

1. Postoperative hemorrhage.
2. Shock.
3. Sphincteralgia.
4. Spasmodic contraction of the levator ani muscle.
5. Edema of the skin.
6. Retention of urine necessitating catheterization.

7. Interrupted or continuous pain.
8. Restlessness and insomnia.
9. Backache.
10. Constipation and fecal impaction.
11. Difficult and painful defecation.
12. Persistent desire to stool.
13. Infection and abscess.
14. Cutting out of stitches and non-union.
15. Sloughing off or retraction of the mucous membrane.
16. Bronchitis, pneumonia, and nephritis.
17. Burning, excoriation, and itching in the perianal skin.
18. Reflex disturbances in neighboring organs.
19. Weakened or impaired control over evacuations.
20. Prolonged convalescence.

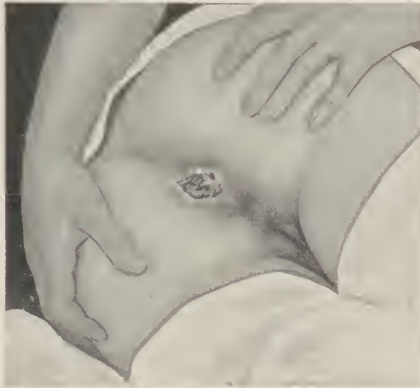


Fig. 354.—Appearance of anus in one of the author's cases of fecal incontinence that followed Whitehead's operation. Note large patulous anus with ulcerated margins.

*Temporary and Permanent Sequelæ:*

1. Loss of sensation and warning of approaching stools.
2. Proctitis.
3. Eversion of the mucosa.
4. Excoriation of the perianal skin.
5. Uncomfortable defecation.
6. Frequent desire to stool.
7. Irritability of sphincter and levator ani muscles.
8. Pruritus ani.
9. Skin-tabs.
10. Discomfort while sitting, riding, or walking.
11. Pain over coccyx and sacrum, down the legs, or in the vesicoprostatic region.
12. Partial or complete fecal incontinence (Fig. 354).

13. Inability to empty the bowel, with resulting constipation and fecal impaction.
14. Urethral irritability.
15. Anorectal fissures and ulcers.
16. Skin polyps from seepage of an irritating discharge.
17. Discharge of mucus, blood, or pus alone or admixed when there is ulceration.
18. Stricture at or above the anus (Fig. 355).
19. Scars entangling sensory nerves contracting the sphincter.
20. Irregular sensitive anal border (Fig. 355).
21. Exposed raw mucosa when it has been sutured to the skin outside the anus (Fig. 357).



Fig. 355.—Typical appearance of strictured anus caused by Whitehead's operation where the suture line gave way and mucosa retracted. Needles indicate points at which the anesthetizing agent was introduced for the author's plastic operation designed to correct the stenosis (see Fig. 359).



Fig. 356.—Broken down suture line and retraction of mucosa, a frequent complication of Whitehead's operation, that often terminates in anal stricture, ulceration, fecal incontinence, or pruritus ani.

22. Moisture between the buttocks from escaped mucus or discharge coming from ulcerated areas left by breaking down of the suture line (Fig. 356).
23. Ordinary recto-urethral or vesical abscess and fistula.
24. Procidentia recti, first degree.
25. Permanent, partial, or complete invalidism.
26. Hyperchondria, nervousness, and melancholia.
27. Drug addiction.

In addition to the above deaths have occurred during the operation or postoperative treatment from hemorrhage, tuberculosis, nephritis, bronchitis, pneumonia, and diabetes.



When Whitehead's operation is not perfect—which is often—the resulting damage is often *irreparable* and the patient becomes a neurasthenic, drug fiend, or chronic invalid, and a burden to himself and family.

The majority of sequelæ result from *non-union* and *retraction of the mucosa* (Fig. 356), *excising all or part of the sphincter* (Fig. 360) or *suturing mucosa to the skin outside the anus* (Fig. 357), and *infection*.

Giving way of the suture line and non-union is usually caused by infection distention of the anus during the evacuation of hardened feces or activity of anorectal muscles. When this occurs the mucous membrane retracts, exposing the musculature and leaving a

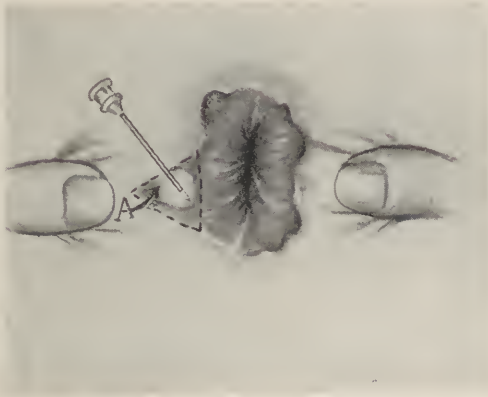


Fig. 357.—Author's local anesthesia operation performed where (A) mucosa has been sutured too far outside the anal margin in the skin in Whitehead's operation.



Fig. 358.—Wound sutured and drained after the mucosa has been excised up to the mucocutaneous border.

wide cuff-like raw area (Fig. 356) that terminates in chronic *ulcers*, or an abundance of scar tissue which contracts, forming *stricture* when the wound partially or completely heals.

The author has treated 150 partial or complete *stenoses* in the anorectal region caused by the Whitehead or Pratt operations, and in numerous other cases narrowing of the anal canal, tightening of the perianal skin, or irritability of the sphincter were observed.

*Fecal incontinence* results about as frequently from hemorrhoidal as fistula operations, owing to tearing of the anal muscle with the fingers, rectal dilators, or operating specula in attempts to divulse it, and removing a segment or all the sphincter by the operator in his efforts to sever the mucosa from the tortuous skin

line (Fig. 360) and free it to the desired height when performing circular excision—Whitehead's operation.

*Patulous ani*, through which mucus seeps to excoriate the skin and cause pruritus ani, are frequent complications of circular excision, and the author has observed *partial* 35 and *complete* fecal incontinence 10 times that resulted from Whitehead's operation.

Loss of sphincteric control caused in this manner is always difficult and frequently impossible to overcome.

Suturing of mucosa to skin outside the anus is the most common sequela of the operation and the condition is responsible for much annoyance. In such cases the exposed mucous membrane (Fig. 357) is constantly irritated by defecation, walking, riding,

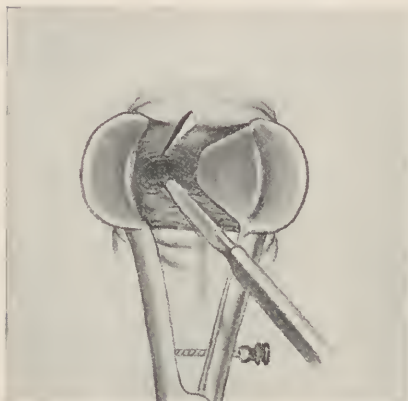


Fig. 359.—Author's local anesthesia operation for anal stricture resulting from Whitehead's operation.

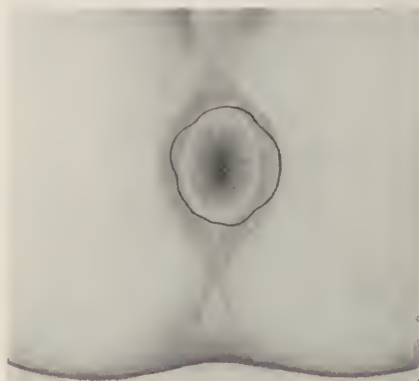


Fig. 360.—Black line indicates manner in which segments of the sphincter are sometimes removed in Whitehead's operation with resultant fecal incontinence.

driving, or the clothing, which incites a mucous discharge that soils the buttocks and linen, excoriates the skin, and causes pruritus ani difficult to relieve.

**Linear Excision.**—For surgeons who prefer to remove piles by *excision* and *suture* rather than with the *ligature* or *clamp* and *cautery operation* the simple procedures outlined below give satisfaction and are less often accompanied by complications and sequelæ than Whitehead's operation.

Complications and sequelæ, barring the cutting out of some sutures and small stitch abscesses, seldom occur during or following the removal of hemorrhoids by *linear excision* because wounds parallel the long axis of the bowel between which *broad strips* of *healthy mucosa* are left that prevent gut retraction, ulceration,

and stricture should the suture line give way, which makes this preferable to the Whitehead or Pratt operation.

Sloughing out of stitches subsequent to operation is unimportant because the mucous membrane cannot retract and the small wounds heal quickly under cleanliness and topical applications.

The chief objection to the procedure is the possibility of infection from wounds where sutures are employed in this region,

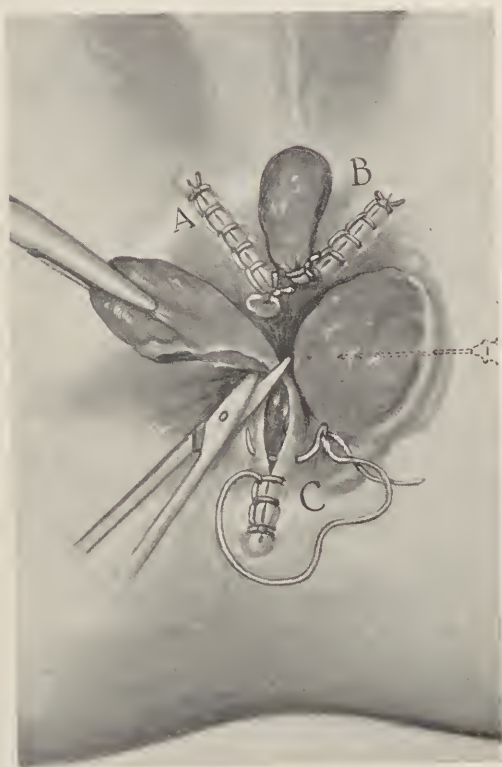


Fig. 361.—Modified local anesthesia linear excision operation as performed by author: *C*, Hemorrhoid dissected upward and wound being closed with a catgut lock stitch; *B*, pedicle of hemorrhoid ligated with ends of the suture; *A*, sutured wound and pile stump after ligation and excision of the hemorrhoid.

but this danger is obviated by the insertion of diminutive drains in the several wounds after the plan previously advocated by the author.

When the suture line becomes infected or an abscess forms, pain and complications from them are promptly relieved by anesthetizing the involved area with eucain, cutting sutures, evacuating pus, and inserting a drain.

**Author's Technic of Linear Excision Operation.**—This procedure (Fig. 361, *A, B, C*) is not intended to supplant the ligature method, which the author *prefers*, but is offered as a substitute for Whitehead's and more elaborate operations that do not provide for drainage.

The technic of removing piles in this way under *local anesthesia* is simple, the operation requires but a few moments, causes but little postoperative pain, and is less often accompanied or followed by complications and sequela than circular excision, and confines the patient in bed for a shorter period.

*First Step.*—The anesthetized hemorrhoid is seized with forceps, drawn outward, and held in a convenient position.

*Second Step.*—Under upward traction the tumor is excised with scissors and spurting vessels are caught and tied (Fig. 361, *C*).

*Third Step.*—After cut edges have been everted, lined up, and made tense the wound is closed by a continuous lock-stitched iodized catgut suture (Fig. 361, *C*).

*Fourth Step.*—A drain composed of catgut, cotton twine, or narrow gauze strip is passed beneath the suture line and allowed to project through the outer end of the wound when deemed necessary.

Following removal of other hemorrhoids in the above manner a slight dressing of antisepticized gauze is placed in the anal canal to prevent wounds from being contaminated later.

Subsequent to this and other excision operations it is advisable to defer evacuations for a few days by keeping the patient on a liquid diet and prescribing an opiate to forestall peristalsis and bowel movements, which otherwise increase discomfort and possibility of infection.

Another and more desirable method of removing hemorrhoids by linear excision consists in excising the pile in *successive stages* by *first cutting and then suturing* (Fig. 361, *C*) until the tumor has been detached and the wound closed.

In this procedure cutting may be started either at the *upper* or *lower* extremity of the hemorrhoid.

When performing linear excision for hemorrhoids connected with skin-tabs or folds they are seized and removed by a *V-shaped* incision (Fig. 361, *C*), which simply lengthens the cut made in removing the varicose pile.

Postoperative treatment following *linear excision* consists in keeping the wound protected and dry, cutting sutures and establishing drainage should infection occur in addition to regulating the diet and movements as indicated during convalescence.



**Mortality.**—There has been no mortality in 5000 hemorrhoidal operations performed by the author, and only one patient died during postoperative treatment—a man who succumbed to diabetic coma. Several deaths from hemorrhage or tetanus incident to the removal of piles are recorded in medical literature.

**Prognosis.**—A permanent cure nearly always follows the ligation, clamp and cautery, and excision operations, but the author has known relapses to occur following each.

Some surgeons needlessly tell hemorrhoidal patients they will never have rectal trouble again following the operation, which is a mistake, since they will be blamed should a thrombotic pile suddenly form or another rectal affection or internal piles subsequently develop, which is not improbable, since rectal veins do not possess valves, and many individuals operated on suffer from constipation, tumors, or obstructive disease of the heart or liver, predisposing factors in hemorrhoids. In such cases there is reason for anticipating a relapse in years to come as old not disturbed by operation and newly formed veins later become distended and enlarged.

Whitehead and his followers remove the so-called *pile-bearing area* to forestall future piles, but the author has observed recurrence following this more frequently than after other hemorrhoidal operations, barring the injection procedure.

The prognosis is not good when hemorrhoids are treated by palliative and non-operative measures, because while hemorrhage and protrusion are temporarily relieved, they seldom if ever cure the patient.

Most surgeons precede hemorrhoidal operations by *divulsion of the sphincter* to prevent or minimize postoperative pain, and difficult micturition, a practise abandoned years ago by the author except when hemorrhoids are complicated with some other anorectal affection that incites spasms of the sphincter or levator ani muscle.

Postoperative pain and sphincter algia are caused chiefly by irritating stitches, large knots, heavy plaited silk or dangling ligation ends, ragged operations, imperfect drainage, or inserting a large gauze *plug or tube*, and encouraging frequent fluid or constipated stools.

Leaving packing and gauze-covered rubber tubes in the rectum is objectionable because they prevent daily movements, are responsible for distention, pain, incite spasms of the sphincter and levator ani muscles, cause intense suffering when removed owing to granulations being enmeshed in gauze, and laceration incident to their removal is frequently followed by alarming hemorrhage.

When by chance a small internal hemorrhoid has been overlooked during operation it is made to shrink up or stop bleeding by injecting it with a 7 per cent. *quinin and urea* solution, and this method of treating piles when the patient cannot lay up on account of business or social engagements or declines radical operation is occasionally justified.

## Chapter XXXV

### Hemorrhoids (*Continued*)

#### POSTOPERATIVE TREATMENT OF SYMPTOMS, COMPLICATIONS AND SEQUELÆ

**Postoperative Treatment of Symptoms, Complications, and Sequelæ Incident to the Removal of Internal, Externo-internal, Combination, and External Cutaneous and Thrombotic Hemorrhoids.**—The majority of individuals having piles are permanently cured in a few days and with little discomfort or delay from business by surgeons having a good surgical technic who carry out the postoperative treatment according to the modern methods.

Patients who, subsequent to hemorrhoidal operations, suffer from excruciating pain, retention of urine, or infection usually have an inexperienced, curious, or meddlesome physician, who, from frequent examination of wounds or making unnecessary treatments, keeps the rectal outlet constantly irritated, which incites sphincter-algia and delays healing.

Formerly the author kept his patients on a fluid diet and in bed one or two weeks following the ligature, clamp and cautery, or excision operation, and tied the bowel up with an opiate for days subsequently to prevent soiling the wounds, but a large experience has demonstrated this plan of treatment to be faulty, and he has learned that individuals operated upon for piles suffer less, are cheerful, and recover more quickly when they are permitted to eat liberally, have daily soft or formed movements, and are allowed to sit up or leave the house or hospital in from two to five days. When patients are kept in bed restricted to a fluid diet and frequently purged for several days they suffer considerable, rapidly lose weight, and become nervous, weak, and discouraged, conditions tending to prolong convalescence.

Patients suffer little and recover quickly when permitted to lead a *nearly normal life*, when taught to secure daily soft formed evacuations with the aid of oil, drinking hot water, medicinal or fruit laxatives, and bathing the parts morning and night with a hot boric acid solution, and to soothe and protect wounds with vaselin or a sedative ointment composed of calomel, gr. xij (0.8); cocain, gr. viij (0.5), and vaselin, ʒj (30.0), used through a pile-pipe.

Many surgeons keep these sufferers miserable in their efforts to *regulate movements*, some by procuring frequent fluid, and others by bringing about constipated stools, neither of which are desirable, since the *former* causes unrest, burning pain, persistent tenesmus, and may lead to extrusion of hemorrhoidal stumps, alarming hemorrhage or infection, and the *latter*, owing to expulsion of retained large compact fecal masses, are often responsible for prolonged bearing-down pain, laceration of the wound, profuse bleeding, or sphincteralgia. Evacuations of either type cause nearly as much suffering as would removal of the hemorrhoids without anesthesia.

**Period of Confinement and Convalescence.**—Nearly all *external* and some small *internal* hemorrhoids are removed in the office under local anesthesia and the patient is permitted shortly to go about his social or business duties while wounds are healing, so long as consistence of the stools is regulated and sphincteralgia is forestalled by a sedative ointment application made to the anal canal through a pile-pipe.

Subsequent to removal of moderate-sized internal tumors the patient is more comfortable and is less apt to suffer from hemorrhage when kept in bed for one or two days.

Except when there is urgent need for the sufferer to be about quickly the author advises persons operated on for extensive multiple internal and combination hemorrhoids to remain indoors or in bed three or more days, to avoid discomfort incident to walking and minimize danger from hemorrhage. Staying at home or in the hospital does not facilitate the sloughing off of ligatures or cauterized tissue or hasten convalescence, consequently the author usually carries out postoperative treatment in the office, a plan that meets with approval of the sufferer, who is able to carry on his business during convalescence.

From ten days to three weeks are required to completely heal hemorrhoidal wounds, but patients do not complain when they are allowed to remain at home or attend to business and avoid hospital expenses.

Hemorrhoidal wounds in persons afflicted with arteriosclerosis, heart lesions, liver affections, diabetes, syphilis, wasting disease, rectal cancer, ulcerative colitis, or marked anemia heal slowly in or out of bed, taking from two to five weeks, and the patient should be informed of this, otherwise he may think the operation was improperly performed.

Following Whitehead's excision or the removal of an unnecessary amount of skin in any hemorrhoidal operation suffering is considerable and convalescence slow.



The following are the most important postoperative *symptoms*, *complications*, and *sequelæ* resulting from hemorrhoidal operations:

POSTOPERATIVE SYMPTOMS AND COMPLICATIONS

1. Sphincteralgia and contractions of the levator ani muscle.
2. Pain.
3. Hemorrhage.
4. Retention of urine and cystitis.
5. Edema of the skin.
6. Dermatitis.
7. Excoriation of the skin and pruritus ani.
8. Failure of ligatures to cut out.
9. Delayed healing.
10. Constipation and fecal impaction.
11. Diarrhea.
12. Infection, abscess, and fistula.
13. Diabetic sloughing and coma.
14. Fissure and ulceration.
15. Sloughing of the anorectal structures.
16. Tetanus.
17. Erysipelas.

TEMPORARY AND PERMANENT SEQUELÆ

1. Painful defecation.
2. Obstipation.
3. Retraction of mucosa.
4. Ulceration of the rectum.
5. Narrowing of the anus or anal canal.
6. Fibrous stricture of the rectum.
7. Partial and complete incontinence.
8. Urethral, seminal, vesical, and prostatic disturbances.
9. Recto-urethral and rectovaginal fistula.
10. Irritability of the sphincter and levator ani muscles.

In addition to the above the following sequelæ are frequently observed after Whitehead's operation:

11. Excoriations of buttocks.
12. Pruritus ani.
13. Loss of sensation normally incited by the approach of feces toward the anus.
14. Procidentia recti.
15. Mucous and skin polyps.
16. Hyperesthetic areas in the rectum.
17. Proctalgia, coccydinia, backache, and pseudosciatica.

18. Discomfort while sitting, walking, or riding.
19. Nervous and reflex disturbances.
20. Recto-urethral and vaginal fistula.
21. Morphin or cocain habit.
22. Despondency and insanity.
23. Discharge of mucus or pus.
24. Stricture.
25. Segments of mucosa sutured into the skin external to the anus.

#### Sphincteralgia and Contractions of the Levator Ani Muscle.—

Painful spasms of the sphincter and levator ani muscles often follow hemorrhoidal operations performed by inexperienced surgeons, and something must be prescribed to alleviate resulting pain and retention of urine.

Ordinarily sphincteric spasms and contractions of the levator ani muscle are promptly arrested by hot fomentations applied to the anus, injection of warm oil into the rectum, rest in bed, and tincture of belladonna, gtt. vj (0.04), three or four times daily, which favors muscular relaxation. In aggravated cases, where this treatment, cleansing the rectum, and change of dressings does not bring relief, a sedative ointment or suppositories containing morphin or cocain, gr.  $\frac{1}{8}$  (0.008), and belladonna, gr.  $\frac{1}{4}$  (0.016), are inserted in the rectum as often as required.

**Pain.**—The author's patients suffer comparatively little subsequent to hemorrhoidal operations owing to his technic and method of dressing wounds.

Pain following removal of piles is usually attributed to sphincteric spasm, but the author's patients suffer less now than formerly when he divulsed or incised the anal muscle, because he no longer employs rectal tubes or plugs, uses heavy plaited silk ligatures, ties three-story knots or ligates tumors *en masse*, and operates under *local anesthesia*, which eliminates discomfort incident to ether—vomiting, straining, and withdrawing of dressings by the semi-conscious patient.

Postoperative pain in the rectum, buttocks, or back may in a given number of cases be caused by (a) plugging or tubing the rectum; (b) removing too much skin; (c) employing large harsh ligatures; (d) keeping the patient upon his back; (e) failing to remove complicating lesions; (f) tying three-story knots; (g) leaving ligatures long and projecting through the sphincter; (h) adjusting the T-binders or dressings too tightly; (i) administering cathartics and enemata which cause straining, defecation, and eversion of pile stumps; (j) *pidling* and *unnecessary* changing of dressings by anx-

ious surgeons; (*k*) needless introduction of the finger, speculum, or proctoscope; (*l*) applications of strong ichthyol, silver, and acids to healthy wounds; (*m*) keeping evacuations fluid or stools constipated instead of *soft*; (*n*) permitting the anus and buttocks to become soiled with discharges; (*o*) cauterizing skin; (*p*) stitching up wounds; (*q*) lacerating mucosa with forceps, and (*r*) neglecting to return tumors or stumps above the sphincters at completion of the operation.

Postoperative pain may be avoided or minimized by employing linen ligatures, not leaving gauze packs or large rubber-covered tubes in the rectum, cutting away ragged tissue, applying vaselin or sedative ointment to the irritable anal canal, loosening tight bandages, permitting the patient to change his position, cleansing the anus of secretions with a warm boric solution to prevent pruritus, applying heat to the anus following defecation and during sphincteric and levator ani spasms, prescribing chopped senna and figs, saline mineral water, a mild dinner pill, mineral oil, or other light laxative to procure soft semiformal daily stools, and allowing a moderate mixed diet and light exercise.

Patients should be saved the excruciating pain caused by surgeons who apply acids and strong stimulating agents to hemorrhoidal wounds that heal promptly in healthy individuals. Topical applications of silver nitrate, 6, and ichthyol or balsam of Peru, 20 per cent., shorten convalescence subsequent to hemorrhoidal operations on individuals afflicted with phthisis or other wasting disease.

When considerable skin is removed the patient is given a combination of morphin, gr.  $\frac{1}{4}$  (0.016), and hyoscin, gr.  $\frac{1}{100}$  (0.006), previously to prevent or lessen postoperative pain which is otherwise annoying.

Pain and sphincter algia not controlled in the above manner is lessened or arrested by injecting hot olive oil, ℥ij (60.0), or starch-water and laudanum, ℥j (4.0), into the lower rectum, applying a cotton pledget saturated in cocain (10 per cent.) to the anal canal, or using the following sedative ointment or suppository:

R̄.	Hydrargyri chloridum mite.....	gr. vj	0¼;
	Ext. belladonnæ.....	gr. viij	0 53;
	Ext. opii.....	gr. vj	0 4;
	Petrolati.....	℥j	30 0.

Misce et fiat unguent.

Sig.—Apply morning and night, using a collapsible ointment tube or pile-pipe.

R̄.	Morphinæ sulphas.....	gr. j	0 06;
	Ext. belladonnæ.....	gr. ij	0 12.
	Olei theobromatis.....	q.s.	

Misce et fiat suppositoriæ No. viij.

Sig.—Insert one as required to relieve pain and sphincter algia.

When pain is excruciating and the patient demands immediate relief it is immediately controlled by a hypodermic injection of morphin, gr.  $\frac{1}{4}$  (0.016).

Individuals who have undergone Whitehead's or modified excision operation invariably suffer more than persons whose piles have been removed by the ligature or clamp and cautery operation.

**Hemorrhage.**—Many physicians worry about patients after hemorrhoidal operations, fearing postoperative hemorrhage, though alarming bleeding from hemorrhoidal operations is very rare in the hands of experienced proctologists who operate under local anesthesia.

The author has never lost a patient from this source, although he has performed several thousand operations in the office, clinic, and hospital. When serious postoperative bleeding occurs it usually results from faulty technic, careless adjustment of dressings, or fooling with the wound, but has been caused by (a) failure to ligate spurting vessels; (b) bruising or tearing the mucosa; (c) not tying ligatures securely; (d) removing too much tissue so ligatures slip from hemorrhoidal stumps; (e) employing edged instead of round needles; (f) sponging or introducing the finger, speculum, or proctoscope following removal of piles; (g) omitting to pack the anal canal when there is oozing, a ligature slips, or cauterized wounds open; (h) neglecting to place a gauze plug over the anus supported by a well-adjusted T-binder (Fig. 365); (i) administering a general anesthetic, which is followed by vomiting or straining, or tearing off dressings by an unconscious patient; (j) overlooking complicated lesions; (k) frequently examining the patient; (l) applying cauterants to fresh hemorrhoidal wounds; (m) refusing to prescribe an opiate to lessen pain and quiet restlessness; (n) administering cathartics or enemata to liquefy feces which causes straining; (o) daily prescribing opiates to tie up the bowel which leads to the collection of hardened feces that lacerate wounds when evacuated; (p) allowing the sufferer to immediately use the toilet instead of bed-pan; (q) careless withdrawal of rectal tubes and packing, and (r) having the patient strain while pile wounds are being examined or treated.

Nurses often unnecessarily become alarmed and call the surgeon to arrest bleeding when there is a *false* hemorrhage or saturation of dressings or bedding with discolored serum or bloody water left in the rectum at completion of the operation.

Following operation enough blood or bloody water may remain in the *sacral hollow* to produce the appearance of serious bleeding when it seeps into dressings. The author avoids this complication



by wiping the rectum dry with cotton or removing blood and water with his evacuator (Fig. 363) before adjusting dressings and binder.

Hemorrhage is said to be external—*visible*—when blood escapes from the rectum or anal region, and internal—*invisible*—when it is concealed or does not show on dressings.

*Arterial* usually results from operations on cutaneous and thrombotic external piles, and *venous* bleeding from internal varicose hemorrhoidal wounds.

Hemorrhage from the removal of piles may occur during or immediately following operation: *primary* happen within from five to thirty-six hours; *recurrent*, due to the slipping of a ligature or sloughing tissue, take place from three to fourteen days; *secondary*, caused by infection, necrosis, cutting out of ligatures, or breaking down of vessels injured by a needle or forceps; or be encountered weeks later; *late hemorrhage*, incident to introduction of instruments or finger into the rectum or evacuation of hard nodular feces before wounds have fully healed.

Anyone can diagnose *external*, but surgeons frequently fail to recognize *internal* or concealed bleeding until the patient is in a dangerous condition. The *symptoms* of *profuse—alarming anorectal—hemorrhage*, named in the order of their importance, are: *irresistible desire to stool, sharp, diffuse colicky pains and marked lower abdominal distention incident to the formation of blood-clots and gas, anxiety, pallor, weak thready pulse, clammy perspiration, lowered blood-pressure, and syncope or shock.*

It is not difficult to *diagnose* bleeding, but considerable ingenuity is often required to ascertain what is causing it. When the bleeding area or spurting vessel is not promptly detected, examination is discontinued and the involved segment of bowel is tightly packed, because when the mucosa is diseased or fragile excessive manipulation aggravates bleeding.

The treatment of bleeding from hemorrhoidal ulcers or wounds incident to their removal varies, since blood may *ooze* or *spurt* from one or several areas or vessels.

Before attempting to control alarming postoperative hemorrhage the author *clears the bowel of all blood by irrigation through a proctoscope*, that bleeding points may be located and prevent blood accumulated in the sigmoid and rectum from escaping later, leading the nurse or physician to believe there is a *recurrence* of bleeding to be arrested.

Operators would save themselves considerable anxiety and more easily control hemorrhage if they realized that hemorrhoids,

fissure, fistula, polyps, hypertrophied papillæ, inflamed crypts, and other more common anorectal lesions are located *low down*, and that hemorrhage following operations for their relief is quickly arrested by *tightly plugging the anal canal* instead of *packing the rectum* only, as is usually done.

The author has fully discussed and illustrated (Figs. 365-373) different methods of controlling anorectal hemorrhage in Chapter XXXVI, consequently they require no further consideration here.

The practice of raising the foot of the bed and applying ice-bags to the sacrum is unsound, for these measures never arrest profuse bleeding. After hemorrhage has been stopped and the patient is weak from loss of blood he is surrounded by warm blankets, given strengthening food and digitalis, strychnin or a physiologic salt solution intravenously or beneath the skin, agents contraindicated earlier because they increase blood-pressure and tend to dislodge partially or formed clots which if left alone might eventually arrest bleeding.

The upper or movable rectum is difficult to pack unless one is experienced, and deaths from perforation or rupture and peritonitis resulting from gauze distention, instruments, etc., have been reported.

Pressure applied in the manner elsewhere described (Figs. 365-375) may be relied upon to arrest hemorrhage however severe. When bleeding is serious from an oozing surface or spurting vessels one cannot rely on adrenalin, Monsell's powder, or other styptics, but slight hemorrhage is quickly controlled by introducing a stypticized gauze plug into the rectum through a proctoscope, removing the instrument, and placing a compact pad over the anus supported by a strong T-binder.

The author has repeatedly succeeded in controlling alarming hemorrhage by the following methods: (a) *placing a Gant pyramidal compress firmly over the anus* (Fig. 365); (b) *ligating vessels* (Fig. 376); (c) *suturing bleeding areas* (Fig. 376); (d) *clamping tissues with pressure forceps left in situ following removal of their detachable handles* (Fig. 376); (e) *distending the rectum with a rubber or cloth inflatable bag* (Fig. 375); (f) *burning raw surfaces with a cautery*; (g) *introducing a large rubber tube or bougie wrapped with stypticized gauze*; (h) *torsion, objectionable because healthy mucosa is frequently lacerated*; (i) *using a proctoscope and tightly packing the anal canal with gauze which is allowed to project through the anus* (Fig. 368); (j) *introducing a cloth bag and tightly filling it with gauze* (Fig. 370), and (k) *inserting a sponge to which is attached strong ligatures tied firmly across a Gant compress after the lower rectum and anal canal*

*have been packed with gauze* (Fig. 373). See Chapter XXXVI for a detailed description of the above procedures.

The last-named procedure is the most reliable, since packing rests firmly against the lesion or wound as a result of its being tightly compressed between the sponge above and pressure placed over the anus.

**Retention of Urine.**—In ten years not more than 100 patients operated by the author for hemorrhoids have suffered from urinary retention needing catheterization. Inability to void urine usually occurs in elderly men having prostatic enlargement or patients suffering from vesical irritation or deep urethral inflammation, but postoperative urinary retention may be expected where piles have been ligated *en masse*, large ligatures are used, rectal tubes are employed, or the patient has been kept under ether for a long time, all of which have been discarded by the author.

Usually retention of urine is quickly overcome by injecting an ounce of warm olive oil into the rectum, applying hot fomentations over the anus and bladder, prescribing belladonna 5 minims (0.3) four times daily to relax irritable anorectal muscles, removing rectal drains or plugs that block the anal canal or irritate the sphincter or levator ani muscle, permitting the patient to get out of bed to urinate, and prescribing an opiate when rectovesical tenesmus or pain is severe.

Some patients are enabled to urinate by placing them in a hot sitz-bath or encouraging them to void through letting them hear water run from a faucet. These measures are not effective when retention is due to muscular spasm incited by hanging ligatures or sutures, rectal tube or scybalæ, which must be removed if the patient is to be speedily relieved.

**Cystitis.**—When catheterization is necessary and the patient develops cystitis belladonna is given to allay muscular irritability and urotropin, gr. vij (0.5), in plenty of water is administered four times daily for its bactericidal and sedative action.

When inflammation does not promptly subside, vesical lavage, using a warm boric acid or weak silver nitrate solution, brings speedy relief.

**Edema of the Skin.**—Edema prior to operation results from complicating thrombi or hemorrhoids strangulated by the sphincter, and continues subsequent to hemorrhoidectomy unless the skin is incised and blood-clots evacuated. Edema resulting from strangulated hemorrhoids promptly disappears following excision of the tumors, divulsion, or division of the sphincter.

Surgeons sometimes unnecessarily bruise perianal skin with



forceps or the speculum, which later becomes edematous and painful, or partially detached segments of integument left by careless operators are subsequently bruised by dressings, walking, or evacuation of feces and may also become edematous. This condition is relieved by cold compresses and snipping off ragged or inflamed pieces of skin.

**Dermatitis, Excoriation of the Buttocks, and Pruritus Ani.**—The discharge after a hemorrhoidal operation seeps through the anus causing dermatitis or itching unless the perianal skin is constantly protected with vaselin or zinc-oxid ointment or painted with a mixture of beeswax, sweet oil, and mutton tallow to keep the buttocks free of irritation.

**Delayed Healing.**—Prolonged convalescence is to be expected in run-down and individuals suffering from Bright's disease, diabetes, obstructive diseases of the heart or liver, locomotor ataxia, tuberculosis, or wasting disease, but healing takes place in from ten days to three weeks in healthy persons where hemorrhoidal operations are rightly performed and postoperative treatment is properly carried out.

When slow healing wounds are continuously bathed in discharge, ulcerative catarrhal or specific proctitis, undetached ligatures, irritating suture material, complicating rectal ailment, pockets that catch septic material or loose ragged overhanging mucosa or skin edges are usually responsible for the irritating *mucus* and *pus*, and must be eliminated or the patient will not make a satisfactory recovery.

Results have been good and his patients more contented since the author began letting them leave the hospital in a short time, allowing a normal diet, procuring complete soft daily evacuations, cleansing the anus with a warm boric solution, and painting the perianal skin with a warm mixture of beeswax, sweet oil, and mutton tallow, or having the sufferer wear a piece of cotton smeared with an ointment containing vaselin and calomel between the buttocks.

Erosions in the perianal skin responsible for stinging pain and pruritus ani are quickly healed by silver nitrate 6 per cent. applications.

Stimulation of fresh hemorrhoidal wounds is unnecessary and the practice of surgeons who cauterize them with strong acids, silver, or ichthyol is to be condemned because such applications cause smarting, sphincteralgia, irritability of the wound, and delay healing, and the same applies to probing, frequent examinations with the finger, and instrumentation.

**Failure of Ligatures and Sutures to Cut Out.**—Annoyance from



this source continues until hanging ligatures and sutures have been removed and sloughing tissue is excised. Expert proctologists seldom encounter this complication because they neither suture hemorrhoidal wounds nor tie piles *en masse*.

**Constipation and Fecal Impaction.**—Constipated and persons having regular movements are sometimes troubled with infrequent evacuations following pile operations, owing to contractions of the sphincter or levator ani muscle that interfere with passage of the feces or their fear of defecatory pain—*rectophobia*.

Sphincteralgia arises less often when tissues are not bruised, hemorrhoids have been dissected up before removal, irregular skin edges are trimmed off, non-irritating linen sutures have been employed, and the accompanying sedative ointment is projected into the anal canal with an ointment tube before dressings are applied and preceding evacuations:

R.	Cocainæ.....	gr. viij	0 53;
	Hydrargyri chloridum mite.....	gr. xij	0 72;
	Petrolatum.....	3j	30 0.—M.

These measures relieve or prevent constipation by allaying pain and quieting the sphincter and levator ani muscle.

When the sufferer is neglectful about following instructions and fecal impaction ensues, relief is to be had from a small hot olive oil, soapsuds, or hydrogen peroxid enema (25 per cent.), which favors softening, breaking up, and expulsion of hardened fecal masses. Constipation being due to local causes, laxatives are seldom required in this class of cases, but oils taken daily lubricate the bowel and favor comfortable defecation.

**Diarrhea.**—Loose movements may be troublesome following hemorrhoidal operations performed on nervous and individuals afflicted with rectal cancer, gastrogenic or enterogenic disturbances, pancreatic affections or ulcerative coloproctitis, and in such cases wounds are irritable and reflex disturbances sufficiently troublesome to temporarily require sedatives and rectal irrigation.

**Infection, Abscess, and Fistula.**—Infection, slight or terminating in abscess, fistula, or septicemia, has not been encountered once in 5000 hemorrhoidal operations performed by the author, and there is no reason why infection should follow a properly performed ligature or clamp and cautery operation when the patient is carefully handled subsequently.

In 95 per cent. of cases where abscess results from pile operations tumors are removed by Whitehead's or a modified excision procedure due to feces or a foreign body lodging in the wound and

causing infection of the suture line. In such cases sutures are cut, or when pus has formed the infected area is incised and drained.

**Diabetic Sloughing and Coma.**—Several times following hemorrhoidectomy the author has known healing to be delayed or gangrenous sloughs to form in the anorectal region of patients in the last stages of diabetes, one of whom died from *coma* following convulsions.

**Fissure and Ulceration.**—Sensitive fissures and ulcers the remains of unhealed hemorrhoidal wounds are occasionally encountered, and when present are treated the same as similar lesions from other causes. Usually these complications result from neglected after-treatment, overstimulation, and cauterization of or frequent introduction of the finger, speculum, or proctoscope into the rectum before wounds are completely healed.

When a postoperative fissure or ulcer is hypersensitive and incites sphincteralgia the anal muscle is infiltrated with eucain and put at rest by divulsion or division and the lesion treated individually, otherwise it remains indefinitely and causes the patient considerable annoyance.

**Sloughing of Anorectal Structures.**—Many times the author has treated small or enormous sloughs and wounds caused by the injection of external and internal hemorrhoids with *carbolic acid*—frequent—or a quinin and urea solution—rare. Sometimes this type of ulceration in run-down individuals assumes a *phagedenic* character and extends in all directions, destroying the skin and mucosa, sphincters, and other structures, eventually causing partial or complete fecal incontinence, recto-urethral, vaginal, or vesical fistula, and slight or alarming hemorrhage (Fig. 329).

Usually sloughs are confined to the lower rectum or perianal skin and terminate in short, blind, or complete fistula. Two patients died in the author's hospital from subcutaneous necrosis, toxemia, and edema of the lungs following the injection of cutaneous piles with carbolic acid.

Recently the author performed colostomy to relieve a man whose entire rectum and part of the bladder sloughed away (Fig. 329) following one injection of carbolic acid made into an internal hemorrhoid by a quack. In this case putting the bowel at rest, cleanliness, and topical applications failed to arrest the destructive process, and the patient finally died of exhaustion. The author has also observed sloughs, varying in degree, occurring from infection or strangulation, at the suture line following Whitehead's and Pratt's pile operations.

Such sloughs are promptly removed with scissors and partially

destroyed tissue is eliminated by calomel applications or continuous wet dressings. Later the wound is cleansed, drained, and stimulated if necessary with a 6 per cent. ichthyol solution until healing is complete, when an attempt is made to repair resulting damage by plastic operation.

**Tetanus.**—Previous to the advent of asepsis several deaths occurred in St. Mark's Hospital, London, from tetanus following hemorrhoidal operations (chiefly ligature), were reported, but this complication is not now feared by surgeons who provide for drainage and carefully carry out postoperative treatment.

Proctologists who have discarded Whitehead's procedure, simplified their technic, and pay particular attention to the postoperative treatment of hemorrhoidal wounds rarely observe *sequelæ* following the removal of piles, but treat many patients that have been rendered miserable, unfit for social or business duties, or made permanent invalids, the result of hemorrhoidal operations performed by quacks, physicians, or incompetent surgeons.

In about 85 per cent. of cases deplorable results are traceable to Whitehead's, Pratt's, and other excision or suture operations and are caused by *injury to nerves, removal of all or part of the sphincter muscle, anchoring mucosa to the skin outside the sphincter, infection, cutting out of stitches, injury to neighboring structures, infection of the suture line, and retraction of the mucosa*, which is followed by *prolonged healing, chronic ulcers, proctitis, stricture, painful defecation, constipation, loss of anal sensation, proctalgia, discomfort while sitting or walking, reflex disturbances in neighboring organs, partial or complete incontinence, excoriation of the buttocks, pruritus ani, and other annoyances.*

With the exception of *stricture sequelæ* referred to are seldom caused by the *ligature or clamp and cautery operation*, and in such cases stenosis results from the *removal of an unnecessary amount of skin* or careless *cauterization* of the integument; accidents that occur only in the hands of inexperienced surgeons.

When Whitehead's or Pratt's excision goes wrong and *sequelæ* are left, one is seldom able to repair the damage, and in consequence those patients frequently become hypochondriacs, give up business, contract the morphin or cocain habit, or threaten to commit suicide.











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